A CHILTON PUBLICATION

the Iron Age

THE NATIONAL METALWORKING WEEKLY

July 2, 1953

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JUL 2.1953
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In this Intricate Assembly

Precision Counts!

and it counts on precision rolled CMP THINSTEEL cold rolled strip steel

assures accurate and uniform components

In business machines, often very intricate assemblies of component parts, CMP THINSTEEL is helping to reduce end product cost. The efficient functioning of such equipment depends on the accuracy to size of many internal parts. The labor cost of assembling such parts may be the big item of cost. Once assembled, the machine must operate smoothly. The best insurance against machine failure is the use of the best raw material for component part manufacture. Experience shows that the best strip steel for accuracy and uniformity is CMP THINSTEEL. Try it for size.

PRECISION COLD ROLLED C M P STRIP STEEL

the Cold Metal Products co.
YOUNGSTOWN 1, OHIO
New York • Chicago • Indianapolis • Detroit
St. Louis • Los Angeles • Cleveland • San Francisco

LOW CARBON, HIGH CARBON (Annealed or Tempered) STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:
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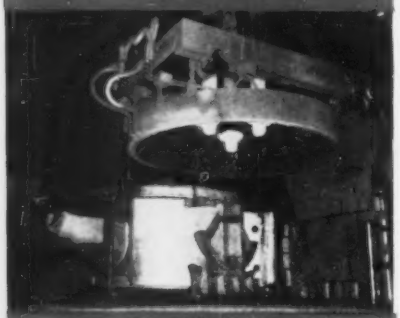
Phone: PLeasant 3-1291
THE KENILWORTH STEEL CO., 750 Boulevard, Kenilworth, New Jersey
Phones: N. Y., COrtlandt 7-2427; N. J., UNionville 2-6900
PRECISION STEEL WAREHOUSE, INC., 4425 W. Kinzie, Chicago • Phone: COlumbus 1-2700

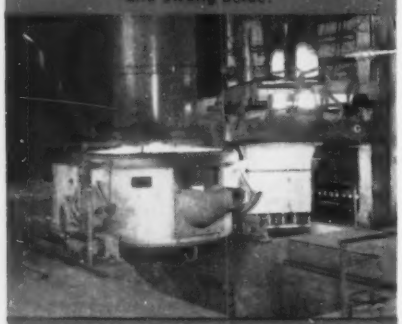
WHITING

Hydro-Arc

ELECTRIC FURNACES



Hydro-Arc furnace with roof lifted and swung aside.



An "orange-peel" drop bottom bucket fills furnace with one drop.

"Business End" of HYDRO-ARC Furnace. Servo Units used to raise or lower electrode arm.

HERE'S THE "Pace-Setter" IN ELECTRIC MELTING!

You ask, "What electric furnace offers the most advantages?" The answer is WHITING HYDRO-ARC because of its important, advanced engineering principles! To name a few:

1. **The Hydro-Arc Automatic Electric Clamp,** pioneered by Whiting, saves up to 90% of furnace down-time for slipping electrodes. It also means an 8% increase in operating time and production . . . and in addition, the elimination of the hazardous electrode slipping operation.

2. **The Unique Hydro-Arc Top Charge,** a load factor improvement, reduces furnace down-time for recharging to only a few minutes. Because of its sound, basic simplicity, limit switches are eliminated and maintenance is held to a minimum.

3. **The Hydro-Arc Air-Counterbalanced Hydraulic Electrode Positioning Equipment** assures less electrical energy and electrode consumption as well as improved metallurgical control and longer refractory life.

Write today . . . for 40 page bulletin FY-168. It completely describes Whiting Hydro-Arc Electric Arc Furnaces!

WHITING CORPORATION

15601 Lathrop Avenue, Harvey, Illinois

Steel Erection Moves Fast with High-Strength Bolts

Erection proceeds at a smooth, rapid pace when Bethlehem High-Strength Bolts are used to join the structural members. These special heat-treated bolts can be installed quickly by a two-man team using a holding wrench and an impact wrench. The bolts are used with hexagonal nuts and hardened washers, and take the place of field-driven rivets.

In erecting steel with Bethlehem High-Strength Bolts, two hardened washers are used with each bolt, one under the head, the other under the nut. This permits the development of maximum clamping force without deforming the connected material.

When bolts pass through beam- or channel-flanges having a sloping inner face, a bevel washer is required to provide a square seat for the bolt head or nut. Bethlehem furnishes these bevel washers in two types, for use with wide-flange beams and standard beams or channels.

Bethlehem High-Strength Bolts are manufactured at our fasteners plant at Lebanon, Pa. They are heat-treated by a process of quenching and tempering, to meet the requirements of ASTM Specification A325.

A request to the nearest Bethlehem office will bring you our interesting booklet, "High-Strength Bolting for Structural Joints."

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem supplies every type of Fastener

The Iron Age

Vol. 172, No. 1, July 2, 1953

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DIGEST of

NEWS DEVELOPMENTS

PLANT TELEPHONES KEEP WORKERS POSTED—P. 71
Westinghouse uses telephonic Communicator to keep supervisors, workers filled in on latest news, company policy. Tape-recorded messages are fed into the in-plant phone system. Dialing a special number tunes the caller into the continuous broadcast. Employee interest is highest for labor news items.

REPUBLIC TAKES LEAD IN PLASTIC PIPE—P. 73
Owings-Sharpe Plastic Pipe & Tubing Co. has a new owner—Republic Steel Corp. This makes Republic the first steel producer to go into active production of plastic pipe. It seems a cinch that others will soon follow Republic as use of plastic pipe continues to mount. Small steel pipe has felt the pressure.

BESSEMER STEEL RID OF NITROGEN 'CURSE'—P. 75
After years of research European producers of Bessemer steel have come up with three processes to cut down nitrogen content of their steel. All methods use oxygen. A Canadian firm will pioneer North American production of "oxygen steel." High nitrogen content in Bessemer steel made it difficult to work, form.

NATURAL GAS EXPANSION SOARING HIGHER—P. 78
Nation's gas utility and pipeline industry will spend almost $4 billion on construction expansion from 1953 through 1956. Natural gas build-up accounts for 90 pct of the expenditure. Transmission and distribution expansion are main factors, but increase in underground storage facilities is important.

MOBILIZERS TAKE STOCK OF NICKEL GOALS—P. 79
Contracts are all lined up to bring U. S. nickel supply to at least 167,000 tons annually by 1956. And this doesn't include a possible expansion of the Nicaro facilities. No contracts are now being negotiated while Office of Defense Mobilization reviews the nation's supply position and outlook for the future.

AIRCRAFT ENGINE PRODUCTION IN TAILSPIN—P. 83
Builders of Air Force jet and reciprocating engines in the past few months have been cutting back production steeply. The small subcontractor has already been hit. Equipment is being idled. Builders worry about adequate storage plans. Excellent durability of engines, cutting back obsolete ones scrambled need estimates.

the Week in Metalworking

ENGINEERING & PRODUCTION

COOL THE COOLANT FOR EXACT MACHINING—P. 129
Magnesium workpieces are extremely sensitive to heat generated by cutting action and temperature changes. By cooling the coolant with refrigerating units at each machine, dimensions which formerly ran 0.003 to 0.008 in. oversize are now being controlled to 0.001 in. total tolerance.

ROTARY FEEDER BOOSTS MACHINE OUTPUT—P. 133
A rotary hopper-type feeder tumbles, selects and feeds small parts automatically to any one of many different machines at a fast, dependable rate. It costs from $400 to $1500 but often pays for itself in a few months from savings in production costs. It promises to extend the trend to automation.

BATCH FURNACES HEAT TREAT SMALL PARTS—P. 136
Charging and discharging of carbon-graphite parts is done simultaneously from both ends of double-end batch furnaces. Positive-type temperature controls maintain rigid firing schedules. Portable fans moved in front of openings accelerate cooling time and reduce nonproductive furnace idle time.

FORGING DIES CALCULATED BY NEW METHOD—P. 138
Calculations of profiles of upsetting dies and visualization of material flow for forging operations are simplified with a new graphical process. It is applicable to dies used in forging parts which are solids of revolution. Material needs can be estimated. Plastic template simplifies its use.

PROCESS CONVERTS ORE TO MAGNETIC FORM—P. 142
By a reduction-oxidation process, hematite can be converted to magnetic form, permitting easy separation. Use of many low-grade taconites is more feasible economically. Pilot plant operation on a continuous basis was satisfactory. Average recovery of 95 pct of gamma hematite had 63 pct Fe.

NEXT WEEK—GAS NITRIDED 4140 STEEL IS TOUGHER
Precision machine parts made from 4140 steel have been successfully gas nitrided. That means lower costs for parts where aluminum-bearing steels are either too brittle or too costly. Part shape is less critical. Nitrided 4140 has a tougher case which is nongalling and highly wear resistant.

MARKETS & PRICES

MOVING LAB TESTS WHEN, WHERE YOU WANT—P. 77
In putting its new Mobilab on the market, Fisher Scientific Co. introduced a laboratory on wheels that it claims is more maneuverable, cheaper than tailor made jobs currently in use. Mobilab's features are described. Fisher says growth of industry has made need for a lab on wheels imperative for efficiency.

TRUCK OUTPUT, SALES SLIPPING DOWNHILL—P. 88
With strikes at Borg-Warner and other suppliers drying up their parts stocks, major truck producers have been forced to cut back operations. Two companies have had to shut down their lines completely. Poor sales in recent months have hurt, too. May factory sales of trucks stood at 93,493, off 26 pct or 33,295 units.

NEW HOPE FOR LEGAL FREIGHT ABSORPTION—P. 93
Federal Trade Commission has reversed its stand on the freight absorption issue. The agency now says it is legal and proper for a producer to pay freight costs, providing the payments are made in the absence of collusion and are made in good faith to meet competition. Congress will now set to work on freight bills.

TOOL BUILDERS WILL ABSORB HIGHER COSTS—P. 99
Drop in new orders for machine tools is regarded as indication that builders will not pass on increased materials costs to customers. Industry backlog dips below 8-month mark for first time in several years, but the civilian tool market is still strong. Toolmakers anticipate increase in their labor costs.

ARE STEEL MILLS CATCHING UP WITH DEMAND?—P. 163
There's no question that steel demand is still very vigorous. But there is increasing evidence that steelmakers are getting closer in their race to fill customer needs. For one thing, not all high cost producers raised prices. And higher prices for steel mean that dollar value of inventories is pushed that much higher for users.

CHILE STUDIES COPPER PRICE, PRODUCTION—P. 166
Indications from Santiago are that the Chileans may revise their copper policy. High-priced Chilean copper has been going begging in the U. S. and other world markets. Result is that stocks now total some 40,000 tons. The price may be due for a trimming—but another possibility is a Chilean production cutback.

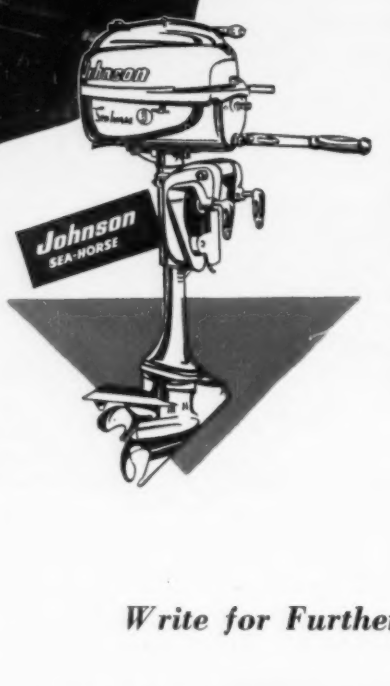
62 AJAX TAMA-WYATT *Induction Furnaces*—

Photo shows a part of the Aluminum Alloy Die Casting Shop at Johnson Motors.

help Johnson Motors produce millions of aluminum alloy die castings per year

Johnson Motors, Division of Out-Board & Marine Mfg. Co., Waukegan, Ill., has the largest aluminum die casting plant in the world using exclusively electric furnaces for melting and holding the metal to be processed in die casting machines for the production of outboard motors.

AJAX Induction Furnaces have proved most satisfactory for this concern because they have automatic temperature control, gentle movement of the metal (which prevents segregation), and amazingly low maintenance cost. Some furnaces have been operating for as long as 7 years without renewal of refractory lining.



"The best holding furnaces for aluminum die casting machines are considered to be electric induction furnaces. Where ingot is being added directly to the furnace for die casting, this is the only furnace on which there is little possibility of sludge formation at the bottom. The reason for that is obvious. The heat is where it belongs, down at the bottom of the furnace **in the metal.** Also, the agitation due to the internal electrical stirring, which has no effect on dross inclusions, gives the best conditions for holding furnaces (for either die casting or permanent molding), especially if it is desired to add pig directly to the furnace."

—From answer to "Quizmaster" question, provided by technical service staff of Federated Metals Div., American Smelting & Refining Co. in March, 1953, issue of American Foundryman.

Write for Further Information to

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

THE IRON AGE

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Indexed in the Industrial Arts Index and the Engineering Index.

Society of Business Magazine Editors

Controlled Circulation Audit

National Business Publications

Are You Ready For Action?

DO you lie awake nights worrying about the unit cost of your product? Have you wondered when the chain reaction on wage increases will end? Or where it will lead to?

Do you waste time yearning for the "good old days"? Days when you could run your own business without worry about unions, management problems, Korea, the atom bomb or your old age.

Do you sweat and strain to cut corners, to reduce costs and to sell so you can stay in business? Have you bought the latest in machine tools, punches, presses and other machinery? Have you cleaned house of the laggards, the deadwood and the cobwebs?

Is your company organization chart streamlined with names that mean something productionwise—followed by names that will do something if the others don't? Have you studied labor relations, personnel relations, modern economics, management growth, new markets and broader horizons?

On top of all this have you retained your sanity? Do you have a clear and balanced outlook on the future? Do you know where you are going and have you planned what to do to your competitors?

If you have done all these things the gloom boys won't worry you with their predictions of dire things to come. But maybe you aren't quite sure you and your company are trimmed down for action.

It will be possible—for some time—to make a good showing if you accentuate the positive. This is a big country—it has a lot of growth left in it. The customers are here, the workers have their talents, they have their wages and you have the means to deliver.

Old tried and true ways of getting business are still good. They will be needed before the year is out. Those who use them will be surprised at the results.

One of the first old-fashioned lessons is to ring doorbells—a sure way to sell if you ring enough. Then you have to know your product from the standpoint of the man using it. Next, don't knock the other fellow's item. You have all you can do to plug your own—no matter what you sell. And the granddaddy of them all is, "Don't let a setback influence your next call." If you do you're done.

Tom Campbell

Editor

NEW BAKER gas-O-matic

. . . ELECTRIC TRUCK OPERATING ECONOMY
. . . . . GAS TRUCK INITIAL COST !

gas-O-matic is a revolutionary new gasoline-powered fork truck with electric motor drive—designed from engine to drive wheels to incorporate the best features of both gas and electric trucks.

The secret of its outstanding performance and amazing operating economy is the new Baker GAS-O-MATIC transmission system. A specially designed variable voltage generator provides an incredibly smooth *unbroken* acceleration curve —directly controlled by the gas throttle.

ELIMINATION OF CLUTCH cures the biggest maintenance headache of gas-powered trucks.

ELIMINATION OF CLUTCH AND GEAR SHIFT prevents jerky starts and "step-ladder" acceleration.

ELIMINATION OF CONTROLLER AND RESISTANCE BANKS of electric and gas-electric trucks means fewer moving parts and results in less down time and lower maintenance costs.

gas-O-matic has the smoothest acceleration and best "inching" characteristics of any fork truck, regardless of type of fuel or transmission. It is ideal for ramp work, for tiering, and for long or short haul operations. In fact it will perform almost any fork truck job better and cheaper.

gas-O-matic will do everything a comparable straight gas truck can do—do most of it better and more economically . . . plus some things that straight gas cannot do.

It will do almost everything a battery-powered fork truck can do—and some of it better . . . plus a few things that battery-power cannot do!

—Yet it costs little more* than a straight gas truck of the same capacity, and only about half as much as a battery-powered electric with charger and two batteries!

* **gas-O-matic** *model illustrated, 4,000 lb. capacity costs only* **$4895.00**

THE BAKER-RAULANG CO. 1853 100th Anniversary 1953 THE BAKER-RAULANG CO.

write for descriptive Bulletin No. 1344

THE BAKER-RAULANG COMPANY
1227 WEST 80th STREET • CLEVELAND 2, OHIO

The Baker-Lull Corporation, Subsidiary, Minneapolis, Minnesota
Material Handling and Construction Equipment

Baker
industrial trucks

Dear Editor:

Letters from readers

Thank You

Sir:

I read your editorials in THE IRON AGE and think you have one of the finest perspective viewpoints on the American way of life and we like what you say.

The writer works with some 65 or more water softener manufacturers in the middle west and it has occurred to me that some of the things you are saying are the things that they should be reading.

I would like to ask if we could get reprints of your editorials which we feel pertinent to conditions to send to these water softener manufacturers. If it would not be possible to obtain reprints of your editorials I wonder if permission might be obtained from you for their reprinting.

J. M. STEWART
Arizona Minerals Corp.
Elgin, Ill.

Industrial Terms Defined

Sir:

In the June 4 issue appears the article "For Your Profit Industry Defines Basic Industrial Ideas."

We find this of great interest and would appreciate your permission to reprint the article for distribution to our members only. We note the continuation to the following week and, if permissible, would like to continue reprinting the subsequent parts of the article. Proper credit would, of course, be given.

J. R. DERRICKSON
Executive Secretary
Formed Steel Tube Institute
Cleveland

Wish we could give you an okay to reprint the article but our understanding with the Society for the Advancement of Management is that we will not reprint it. Contact the society at 411 Fifth Ave., New York 16, N. Y., for their special rates on quantity orders which may meet your needs.—Ed.

Cold Extrusion

Sir:

Do you have any information relative to cold extrusion of alloy steels? Also, do you know of any sources presently cold extruding alloy steel parts?

F. B. LEWANDOWSKI
Research Engineer
Research Development Div.
Timken-Detroit Axle Co.
Detroit

We know of no one extruding alloy steel parts on the production basis. Alloys, however, have been cold extruded experimentally. At the moment, in commercial practice, the users of cold extruded parts are substituting cold worked 1012 carbon steel for quenched and drawn alloys such as 4130. Ordinarily, unless low temperature impact properties are needed or some other special requirement, it would be a waste of money to use alloy when the required mechanical properties can be achieved through cold working.—Ed.

Cleaner Castings

Sir:

In your June 18 issue under THE IRON AGE Newsfront you list the following:

"Truer, cleaner castings are reported possible with use of foundry sand treated with a resin . . . "

Can you tell us where we may obtain further information on this item.

E. L. ALTENBURG
Executive Vice-President
Atlas Steel Casting Co.
Buffalo

More details on the resin for treating foundry sand may be obtained from the Plastics Div., Monsanto Chemical Co., Springfield, Mass.—Ed.

Conserve Alloys

Sir:

An article appearing in your Apr. 9 issue entitled "Alloys: Conserve Now—Be Safe In War" is of special interest to our engineers, who are investigating ways to conserve critical materials.

It would aid our program if we could obtain 70 reprints of this article for distribution to laboratories, procurement offices and engineers of the U. S. Army Corps of Engineers. If reprints are not available, we would appreciate your specific permission to locally reproduce this article in exact detail for the same purpose. In the later case, proper credit will be given to THE IRON AGE.

W. H. KINDLE
Asst., Procurement Div.
Military Supply
Dept. of the Army
Office of the Chief of Engineers
Washington

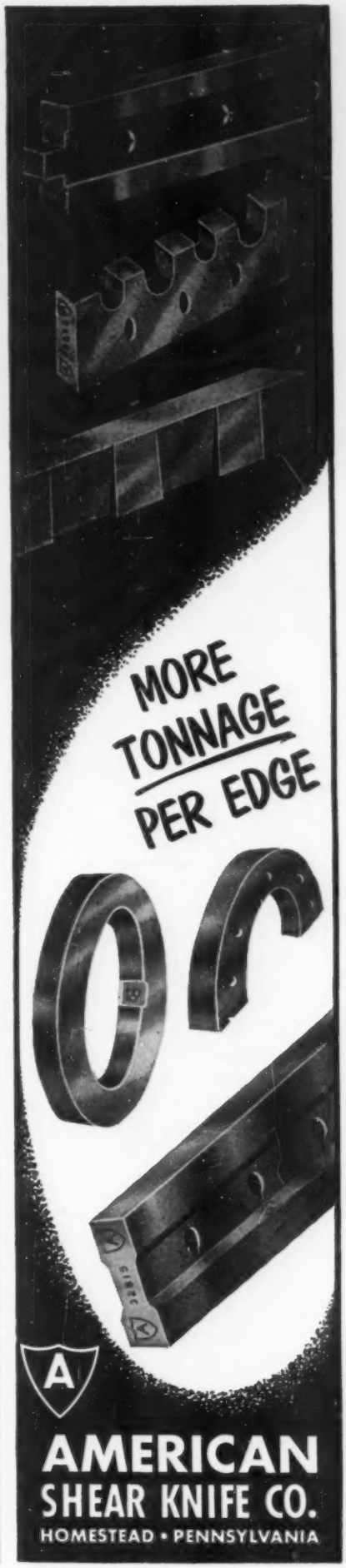
Temporary Tooling

Sir:

In the June 18 issue, p. 171, a Wharton Universal jig and fixture system is mentioned. We would like to secure more information on this item.

E. F. SAYRE
Factory Engineering Dept.
Philco Corp.
Philadelphia

Further information can be obtained from the General Electric Co., 1 River Road, Schenectady 5, N. Y., who is using this system.—Ed.



for heat treating

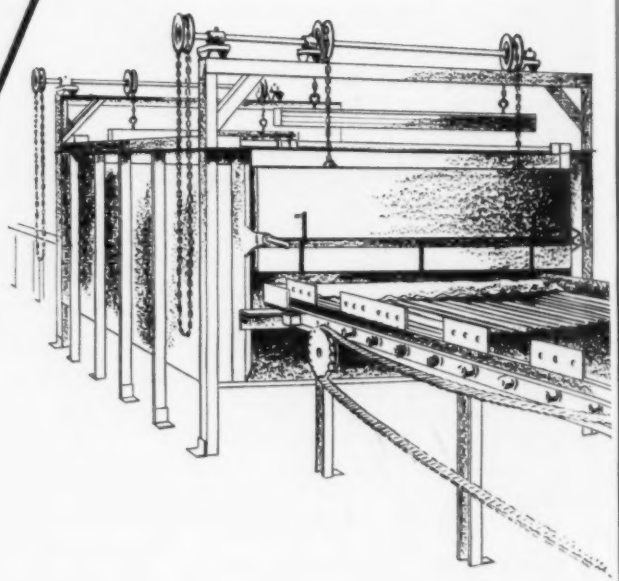
ihp*

IMPROVES QUALITY

Non-ferrous tubing annealed in this furnace at a rate of fifty pounds per minute has such uniformity in grain size that differences cannot be detected. Oxidation is minimized by a reducing atmosphere, proportioned and kept at constant pressure by a mechanical mixer. Temperatures up to 1200° F. are used, depending upon the type of anneal required.

Results from this Selas furnace are typical of those achieved through the use of *Improved Heat Processing* . . . a term embodying improved methods and modern equipment.

Used in all types of industries, *Improved Heat Processing* is popular for ferrous and non-ferrous metal working and treating. Further information on any Selas process will be sent upon request.



***Improved Heat Processing**

SELAS

CORPORATION OF AMERICA

PHILADELPHIA 34, PENNSYLVANIA

Heat Processing Engineers for Industry • Development • Design • Manufacture

Fatigue Cracks

by William M. Coffey

Exercisers Anonymous

Out in the land of the lawns that always need cutting—where every weekend from sun-up to down the clickety-clack of a thousand power lawn mowers shatter the stillness of what should be two restful days for tired commuters—a new movement has been started. It's a magnificent idea that already has swept through the little suburban towns of New Canaan and Norton, has engulfed Stamford and is spreading west towards New York City like a prairie fire. Designed to rescue pitifully lost *exercise* souls and restore to the Indians the virgin forests, weeds and crabgrass, uncluttered by little picket fences, rose gardens, stately lawns or cute little vegetable patches, it's called *Exercisers Anonymous*. All that is needed to join is a hammock, two shade trees, a telephone —and a deep-seated desire never to exercise again. A new member must swear off the stuff forever. The founders know, however, that it is not easy to give up exercise in the face of wifely pressure and years of habit. Everybody needs help. So, whenever a member feels he can't fight it any longer, all he need do is to get to a telephone and ask the operator for the nearest chapter of Exercisers Anonymous. One or two fellow members, depending upon the seriousness of the case, will come immediately with ready-mixed Mint Juleps and sit quietly with the new member until the horrible craving goes away. *Want to join?*

Only One Number One (II)

We are continuing this week the series started last week on the editorial merits and achievements of THE IRON AGE—the editorial *power* of THE IRON AGE—in the hope that you will immediately rush your subscription renewal along with your $8, which is less than 16¢ each for 52 brilliant, weekly issues. We will be happy to cash your check.

With the notable exception of this column, the editors have been working like mad to make your ffj easier to read. This is a continuing project and to notice the improvement you need only pick up last week's issue.

There are people who specialize in training other people to read better and faster. (We wish we could read). One of these "better reading" outfits is the Reading Laboratory, just a Kiner from our office. They sent us a booklet last April and the brains department ran a little 10-line item to say as how it was available for free. The records have shown that so far 222 people have written for the booklet, which is an amazing response for any 10-line little item. That's what publicity can do. The power of THE IRON AGE is liable to make millionaires out of the Reading Laboratory people or anybody.

What, Again?

Just got back from Canada where the favorite expression is "what part of the States do you come from? The answer, of course, being "not from the States, from Texas." Did manage, however, to pick up a little joke that's going the rounds up there in the land of Labatt Beer, which brew has the heartiest endorsement of the murderer of this column.

> **"Pardon me, do you know a fellow in these parts with one leg named Wilson?"**
>
> **"Can't say I do, stranger; what's the name of his other leg?"**

You can pick up any number of smart, new jokes like this in Canada.

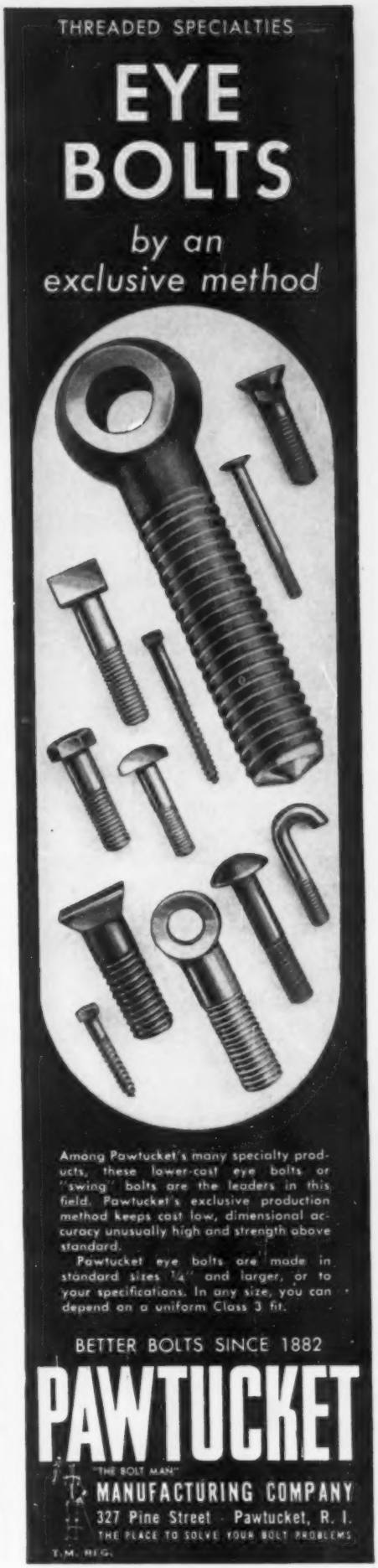
Puzzlers

The answer to the "second-hand clothing man" puzzler, submitted by Mr. H. G. Taylor of the Diamond Chain and Mfg. Co., is 30 coats, 33 trousers and 84 vests. Don't ask us what he does with all the vests. The winners: Edwin J. Montgomery, Robert Hill, Keith Hebble, Josephine Ardovino, Bill Farley 3rd, Charles E. Norton, R. F. Wheaton, Samuel E. Bey, A. J. Reardon, W. B. Lobbenberg and Mr. Rice. We received many wrong answers to this one, the reason, perhaps, because it was not understood that the greatest number of 3-piece suits had to be bought. This, of course, is 30.

New Puzzler

A pilot is flying at constant altitude with a true airspeed of 120 mph on a true north heading. There is a steady north-east wind of 40 mph. As he passes over the church steeple at Wappletown he encounters a child's balloon floating freely at his altitude. He continues his flight for ½ hour, then decides to go back and take another look at the balloon. What heading should he fly and for how long to find it?

Many thanks for this one to Mr. Howard M. Smith, General Manager of American Spring of Holly.


THREADED SPECIALTIES
EYE BOLTS
by an exclusive method
Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.
Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.
BETTER BOLTS SINCE 1882
PAWTUCKET
"THE BOLT MAN"
MANUFACTURING COMPANY
327 Pine Street · Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

Multiple spindle automatic builders do not deny the importance of good frame design. As early as 1920 Cone's revolutionary frame was substantial evidence that Cone did something about it.

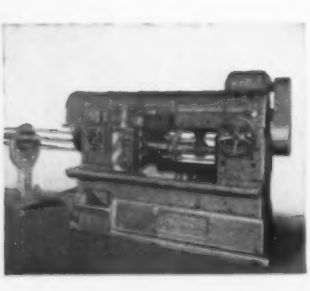
For some time there has been discussion concerning the relative merits of the use of 100% carbide tooling on multiple spindle bar automatics. There has been very little information made available about successful carbide application to this type of machine by its builders or by carbide suppliers. But Cone is doing something about it.

The Conomatic Carbide Development program is accumulating much helpful information for "automatic" users through test runs under production conditions. The illustration is an example of such information applied to an actual production run. Full data is available.

Action speaks better

MATERIAL—ALUMINUM: Hole drilled with 1" and 1 9/16" dia. drills to 1½" depth, and tapped to ¾" depth.

	HSS	CARBIDE
Cycle Time	90 secs.	11 secs.
Work Spindle Speed	270 R.P.M. at 104 S.F.	830 R.P.M. at 320 S.F.
Tool Wear	5,000 pcs. per grind	20,000 pcs. per grind



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

Dates to Remember

Meetings

JULY

TRUCK TRAILER MANUFACTURERS ASSN.—Annual summer meeting, July 23-24, Edgewater Beach Hotel, Chicago. Association headquarters are at 1024 National Press Bldg., Washington.

NATIONAL TOOL & DIE MANUFACTURERS ASSN. — Summer meeting, July 30-Aug. 1, Milwaukee. Association headquarters are at 907 Public Square Bldg., Cleveland.

AUGUST

WESTERN ELECTRONIC SHOW & CONVENTION—Aug. 19-21, Civic Auditorium, San Francisco. Headquarters are at 1355 Market St., San Francisco.

EXPOSITIONS

NATIONAL METAL SHOW—Oct. 19-23, Cleveland.

NATIONAL AUTOMATIC MERCHANDISING ASSN.—Convention & Exhibit, Aug. 23-26, Conrad Hilton Hotel, Chicago. Association headquarters are at 7 S. Dearborn St., Chicago.

SEPTEMBER

ELECTROCHEMICAL SOCIETY — Fall meeting, Sept. 13-17, Wrightsville Beach, N. C. Society headquarters are at 235 W. 102nd St., New York.

NATIONAL PETROLEUM ASSN. — Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters are at Munsey Bldg., Washington.

NATIONAL FOUNDRY ASSN.—Annual meeting, Sept. 16-18, Plaza Hotel, New York. Association headquarters are at 53 W. Jackson Blvd., Chicago.

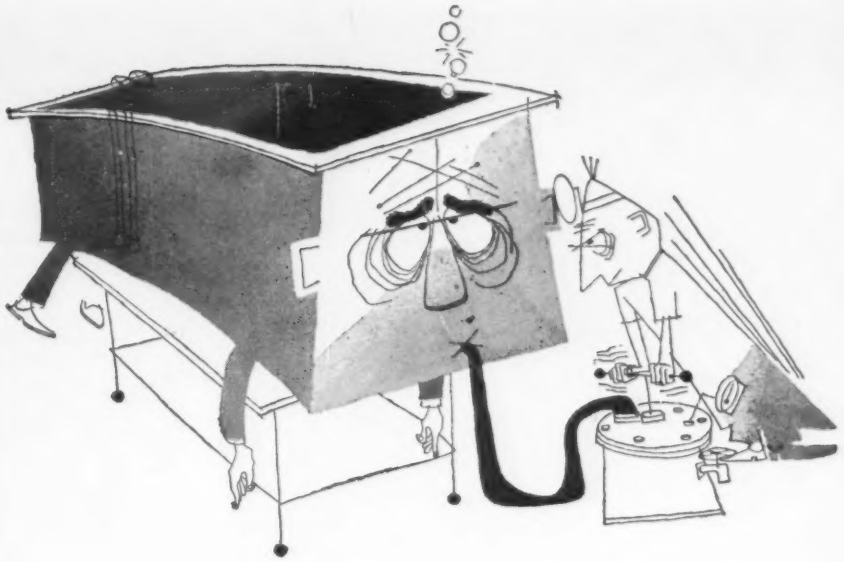
PACKAGING MACHINERY MANUFACTURERS INSTITUTE — Annual meeting, Sept. 20-23, Skytop Lodge, Pa. Institute headquarters are at 342 Madison Ave., New York.

TRUCK BODY & EQUIPMENT ASSN., INC.—Sept. 21-23, Sheraton-Gibson Hotel, Cincinnati. Association headquarters are at 1122 Dupont Circle Bldg., Washington.

AMERICAN MINING CONGRESS—Metal and Nonmetallic Mineral Mining Convention, Sept. 21-24, Olympic Hotel, Seattle. Headquarters are at 1200 18th St., Washington.

INSTRUMENT SOCIETY OF AMERICA —National Instrument Conference and Exhibit, Sept. 21-25, Chicago. Society headquarters are at 1319 Allegheny Ave., Pittsburgh.

NATIONAL ASSN. OF FOREMEN—Annual convention, Sept. 23-26, Milwaukee. Association headquarters are at 321 W. First St., Dayton.



has **coil-itis*** cramped your production flow?

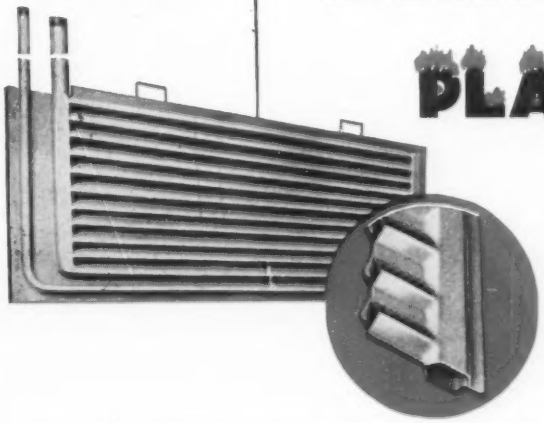
It's a waste of costly time to pump out the solution every time your process heating and cooling tanks get indigestion due to pipe coil troubles. You can save this cost and eliminate production bottlenecks by replacing the pipe coils with Platecoils. Platecoils can be removed and replaced **without dumping the solution.** They simplify maintenance and save hours of downtime. They heat or cool 50% faster and take 50% less space in the tank. As revolutionary as the new wonder drugs, Platecoils cure production troubles involving heat transfer . . . and give profits a shot in the arm.

Write for bulletin P73 today!

PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS TRIPLE PRODUCTION

At Continental Motors Corp., 3 crankcase sections can be cleaned at one time when Platecoils are used while only one crank case can be cleaned with pipecoils in the tank. Ask about other case histories.



PLATECOIL

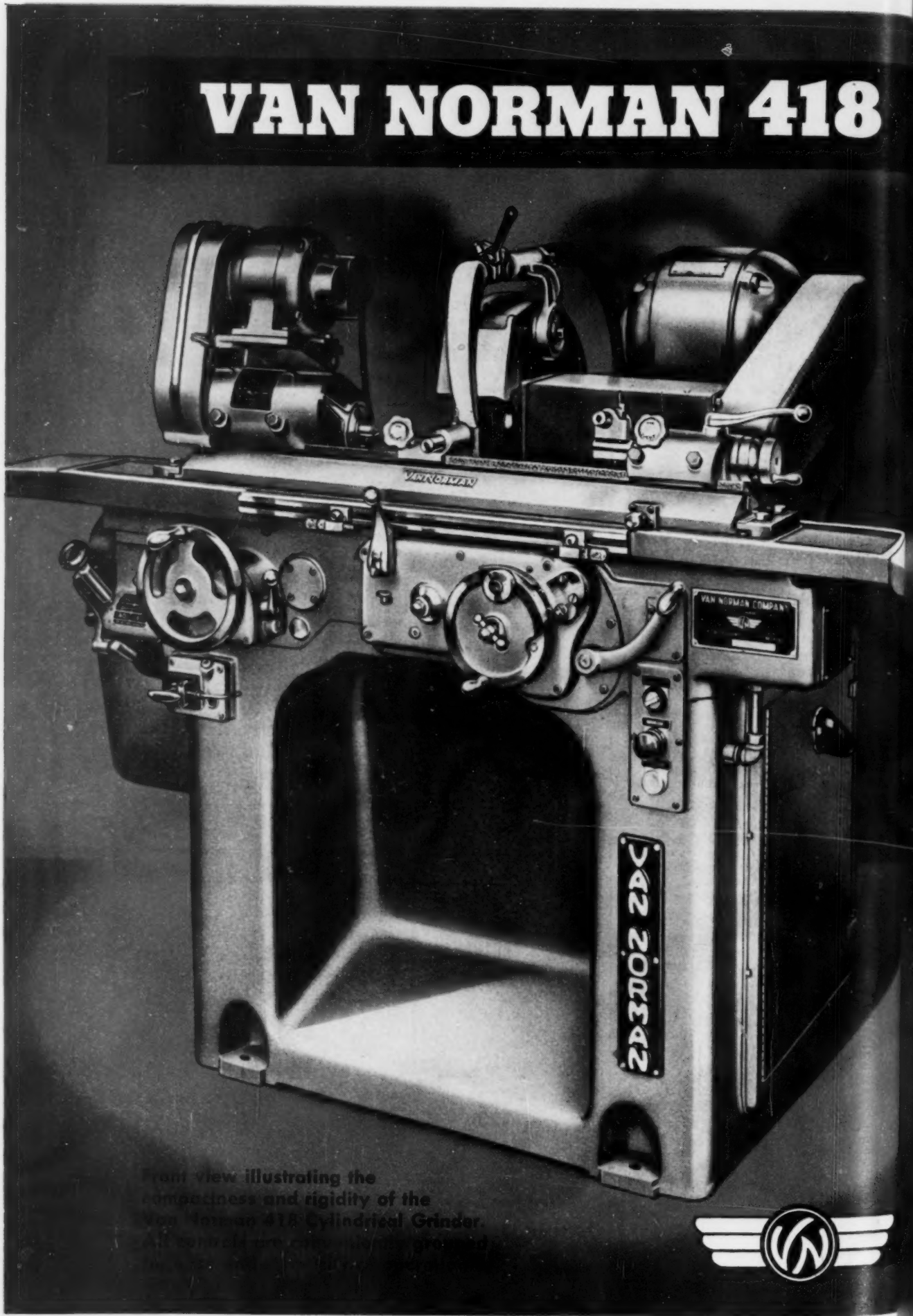
REPLACES PIPE COILS

*

Coil-itis — Diagnosed as tank heating and cooling problems. **Platecoils** — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, TRANTER MANUFACTURING INC., LANSING 4, MICHIGAN

VAN NORMAN 418



Front view illustrating the compactness and rigidity of the Van Norman 418 Cylindrical Grinder.

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

BETTER IMPACT RESISTANCE AND GOOD LIFE under heavy rough turning operations are claimed for a carbide cutting tip now being tried experimentally. Changes in grain size and sintering method are believed to account for the improved tool life under these conditions.

DUCTILE IRON BAR for maintenance and machinery applications is being produced by a large Midwest foundry on a pilot basis. Production to date is restricted to cast round bars to 24 in. in length and to 5 in. in diam.

PARTICLE SIZE DISTRIBUTION of powdered materials can be analyzed in a fraction of the time and much more accurately with a new laboratory instrument. Quality control of metal powders, abrasives and ceramic materials can now be tested on a production basis. Testing time has been reduced to minutes. Probably error is ±3 pct.

OPERATING LIFE OF MANY GREASES AND OILS containing soaps as gelling agents can be extended, recent government studies indicate. Tests show that a variety of silicone fluids and silicon-containing compounds are effective in preventing oxidation of synthetic diester greases at test temperatures of 200°F.

VERY HIGH GRADE IRON ORE may be mined near Ajo, Pima County, Arizona as a result of 20 year mining rights recently signed. One source estimates 3 or 4 million tons of surface ore, a sample of which has been assayed at more than 63 pct Fe.

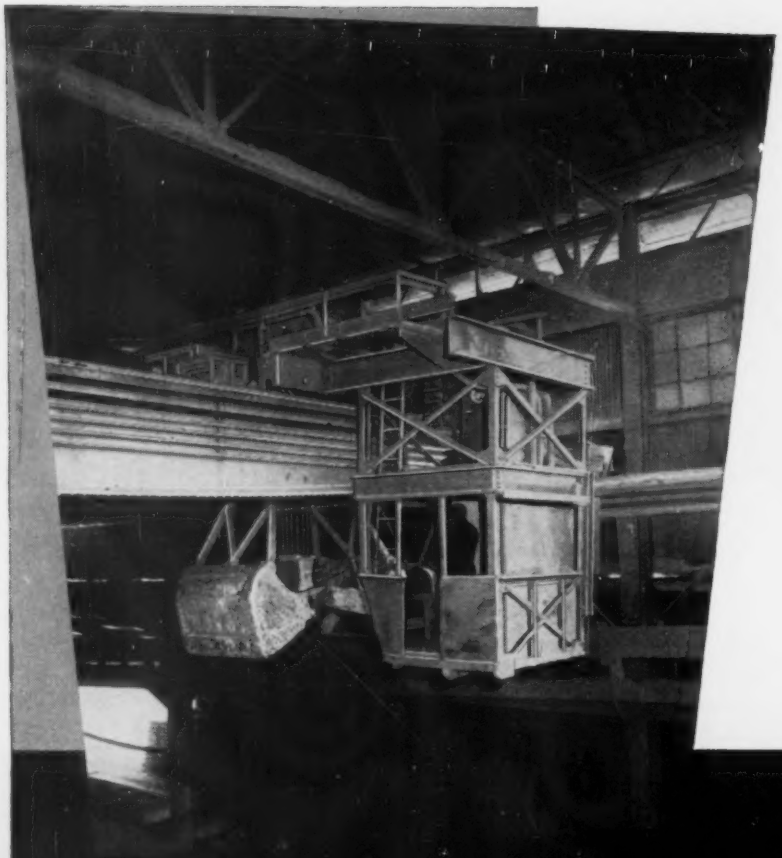
FORCE OF THE HEART BEAT is being measured by strain gages. An SR-4 gage of the type used to measure strain in metals, plastics and rubber is cemented to a metal arch about an inch long. Ends of the arch are surgically stitched to the heart of a dog. Lead wires from the chest provide an oscillograph record.

MAKERS OF INDUSTRIAL FASTENERS took a cue from the steel industry in making the latest price boost. The hike, which came only after exhaustive cost studies, is designed to make each product stand on its own feet. Bar extra revisions, base price rise, and wage boost put triple load on fastener industry costs.

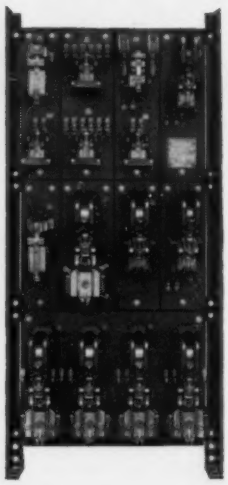
SMOOTH SURFACE FINISHES of 15 to 20 microinches are being obtained on cold-extruded parts directly as they come from the press. No honing, grinding or machining is necessary. The method offers possibilities of lower finishing costs on many steel parts.

INCREASED CONSTRUCTION OF SELF UNLOADING SHIPS promises to greatly relieve bottlenecks in transportation of ore, coal and limestone on the Great Lakes. All-rail shipments of coal should be affected most as more self unloaders swing into action.

DECLINING WHOLESALE PRICES ON USED CARS pose a first-class problem for new car dealers. Average wholesale price of used cars has declined more than $220 during the past year, it is estimated. Finance companies are tightening credit restrictions, particularly on used cars.



This EC&M Braking Panel replaces all mechanical braking devices in southern fertilizer plant and operates satisfactorily in severe acid atmosphere.



Change-Over to Dynamic Braking Control by EC&M Results in Smoother, Safer Operation of Bucket Cranes

Dynamic Braking Bridge-Stop Control provides an all-electric braking system in which the **driving** motor also acts as the **braking** motor. Operator applies normal stopping by means of a 2-position foot switch which gives two points of dynamic braking depending upon the speed of the crane and the accuracy of stopping desired. Should power fail, dynamic braking is automatically applied to bring the crane to rest quickly, regardless of the position of the master switch.

SOMETHING had to be done! One of the cranes in this plant had partially jumped the runway when power failed at instant of plugging. Ordinary braking methods failed. Magnetically-released, mechanically-set brake wore down rapidly under hard service. Motor burnouts, shaft and gear failures spelled costly delays. Repairs were a nightmare.

So, a change-over was made to all-electric braking. This eliminated costly production delays. Maintenance became merely a routine inspection of motors and controllers. Operation became 100% satisfactory. And the operators warmed up to the smoother stopping.

Dynamic Braking Bridge-Stop Control offers advantages for your cranes. May we send you Bulletin 921-6.0?

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

POLICY: Keep Record Straight by Phone

Westinghouse uses telephonic Communicator to keep supervisors, workers posted . . . In-plant phones carry taped announcements . . . Labor news tops—*By J. B. Delaney.*

Having trouble keeping your foremen and supervisors informed in company policy, fast-breaking labor developments, latest trend of sales and shipments? Are you looking for a fast, accurate means of countering dangerous rumors?

Westinghouse Electric Corp. is solving these and other problems with its telephonic Communicator, now in its sixth year at the East Pittsburgh Works.

Keeps The Record Straight

Morning newspapers recently carried an incomplete, inaccurate version of a company wage and pension offer during contract negotiations with two unions.

That afternoon, a detailed and accurate report on the offer was available to some 1000 supervisors at the plant through the Communicator. By day's end these men were armed with the facts ready to give their crews a complete fill-in on the company's proposal.

Most of the work of the Communicator is not so dramatic. It was not installed primarily to deal with labor matters, although it is often used for that purpose. Its main function is to inform management people on a multitude of day-to-day situations and policy matters, to help them do a better job.

How It Works

Messages are recorded on tape and piped into the in-plant telephone system. To hear the message, a supervisor dials a special number on his office or shop phone. An automatic counter records each call. Thirty calls can be handled simultaneously. Length of messages ranges from 2 to 6 minutes.

Reports are broadcast continuously 24 hours a day, Monday through Friday. Normally, messages are changed twice weekly—Monday morning and at noon Wednesday. In an emergency, spot news can be recorded and fed into the system within an hour.

VOICE OF MANAGEMENT, this transmitter is the heart of Westinghouse Electric Corp.'s Communicator system at East Pittsburgh Works. Taped messages are continuously sent over in plant phone lines by this standard machine fitted with a special "tower" designed and built by Westinghouse engineers.

It's No Secret

An unlooked for by-product of the Communicator is the increasing number of rank-and-file workers who listen in on the messages. The "secret" telephone number that dials in the broadcasts didn't stay that way long.

Local 601 of the CIO United Electrical Workers published it in the union newspaper. One of the duties of a union stenographer is to transcribe each message of the Communicator.

Some supervisors resent listening by unauthorized personnel but the company feels it's all to the good. It does preclude use of the Communicator for strictly confidential information, but this can be taken care of through management meetings and personal contact.

Listener interest varies. If the message is timely and vital, the word goes through the plant like wildfire and the Communicator switchboard blazes like a Christmas tree. If it's dull, the "don't-waste-your-time" signal is on, and calls drop off.

Labor relations topics invariably draw a flood of calls. Record so far was the 6697 calls to hear the company's side of a controversy over the disciplining of a group of employees last summer. Other labor matters have drawn nearly 5500 dialings. Three thousand or more calls on labor matters are commonplace.

What It Does

Other interest-getters include company business conditions, spot plant news, employee benefits, miscellaneous plant information, general economic conditions, quality control, and non-plant activities, in that order. A Christmas message that included carol singing drew over 3000 calls.

Westinghouse admits the Communicator is not a cure-all, but a supplement to the overall job of channeling information to supervisors. In a series of roundtable discussions with THE IRON AGE, a representative group of plant management people cited these advantages:

▸ Invaluable for keeping the

Special Report

COMMUNICATOR COST SHEET

INSTALLATION

	Labor	Material	Total
Mis. Switching Equipment		$1,475	$1,475
Rearrangement and Installation of Equipment	$600	300	900
Two Tape Recorders		750	750
Microphones, Tape, Spare Parts, etc.		400	400
Tape-Storing drums	1,300	200	1,500
Recorder Modifications	200	75	275
Total	$2,100	$3,200	$5,300

STAFF

A staff assistant of Industrial Relations Department generally selects, prepares, writes and records routine messages. An hourly rated employe of Telephone Department assists in the technical side of recording and transmitting messages.

OPERATION

Messages are initially recorded on portable tape recorder. No special studio is needed, although a relatively quiet office without possibility of telephone interruptions is desirable.

record straight on controversial matters, especially differences of opinion between union and management. It enables foremen to clarify any garbled or malicious rumors about the company.

▸ It cuts down on the number of time-consuming, often hard-to-arrange meetings to discuss vital issues. It answers questions that foremen once had to put to superiors either by telephone or in person.

▸ It has considerably reduced telephone calls to harried industrial relations executives for clarification of newspaper reports on labor matters, or technical questions concerning insurance, pensions, or other issues affecting the worker and his job.

▸ It is doing a good job of educating foremen on company policy. In this connection it supplements other sources of information available to supervisors.

Supervisors have implicit faith in what they hear on the Communicator. They frankly admit they don't dial in on every message but most listen when something important is being discussed, often calling back to refresh their memories. They appreciate top management's interest in making the information available to them.

A similar communications system is now operating at Westinghouse's Buffalo plant. While no special effort has been made to extend the system company-wide, other company plants are interested.

Prices

Steel:

Major steel consumer evaluates steel extras cost.

Some large steel consumers are just now completing their analyses of new steel extras and their impact on costs.

A manufacturer using approximately 500,000 tons of steel per year has come up with the answer on a large variety of steel products. The figures represent the experience of one consumer and could not be considered a criterion or an average for all steel users.

There are a few surprises. For instance, the product that rose the least was plates—$2.55 per ton, an increase of 2.5 pct. Hot-rolled bars rose approximately $4.75 per ton, a 4.8 pct boost. These two products have traditionally been underpriced, and it was assumed the extras on them would be increased substantially.

On a weighted average, extra costs of this steel used on all steel products purchased are up $5.49 per ton. The base price increase that followed added another $6.01 per ton, making a total of $11.50 or an overall increase of 7.8 pct.

Steelmakers Cooperate

The extra advances for this company included $30 per ton, or 2.9 pct on stainless steel, and about $18 or 8.1 pct on alloy steel. Others were approximately $15 or 9.5 pct on cold-rolled strip; $10.75 or 6.8 pct on cold-finished bars, over $10 or 9.3 pct on hot-rolled strip; more than $7 or 7.3 pct on hot-rolled sheets, about $5.50 or 4.8 pct on cold-rolled sheets, nearly $10 or 7.8 pct on enameling sheets, and roughly $5.75 or 6 pct on structurals.

Steel producers cooperated in the analysis, which included a detailed product-by-product study in terms of size, gage, finish, shapes, and tonnages consumed. The information was then coordinated to arrive at a weighted average.

Analyze Order Pattern

A further analysis is now being made to determine where the order pattern can be changed to minimize effect of the extra changes. This is worth the time and effort. On a previous change in steel extras, one firm reported saving $26,000 per year in one plant through modification of size orders.

Last week IRON AGE estimated that recent steel price increases have added over $800 million per year to America's steel bill—based on current production rates. Total increase averages about $9.30 per ton, with $4.30 representing base price increases and about $5 in extra charges. Base price increases pushed up IRON AGE'S Finished Steel Composite to 4.632¢ per lb from 4.417¢ per lb.

PLASTIC: Republic Takes The Lead

Republic Steel buys plastic pipe firm . . . First steel firm to begin commercial production of plastic pipe . . . Others expected to follow . . . Research pushed—*By R. M. Lorz.*

Republic Steel Corp. is the first steel producer to go into active production of plastic pipe. Republic made this move with purchase of Owings-Sharpe Plastic Pipe & Tubing Co., Magnolia, Ark.

Charles M. White, president, explained the move this way: "Republic has entered the plastic field because plastic pipe and tubing, with its wide applications, has a very definite place in today's industrial picture."

Opportunity Knocked

Like a number of other steel firms Republic had been contemplating experimental work on the light weight substitute for some time. When opportunity to take over the Arkansas company presented itself officials jumped at the chance to experiment and produce in the same location.

Owings-Sharpe was founded in November 1952. Production didn't get underway until about 3 months ago. Since then "a handful" of men have been making thermoplastic pipe on two extrusion machines. Limited output of pipe ranging from ½ to 6⅝-in. has been going to oil company users.

At this point Republic executives admit they are cautiously feeling their way. They have no immediate plans for expansion. For the time being there will be some production of oil country goods. But the major effort in the near future will be devoted to research and market study.

Others Will Follow

Republic's newest venture isn't a big producing operation and it probably won't be for some time. "We're starting practically from scratch," one official said, "and there is a lot of work to be done."

Under optimum conditions informed sources believe Republic could turn out 6 million ft of 2-in. pipe in a year on a three-shift basis. Actual production probably won't approach that figure.

Other steel companies will undoubtedly follow Republic's lead. The move seems almost obligatory, as use of plastic pipe and tubing continues to grow.

Since its commercial introduction in 1948 plastic pipe has made definite sales inroads. Some plastic pipe producers estimate potential market for smaller sizes at $250 million annually. Steel firms realize plastic pipe resists corrosion and electrolytic action, and can cut down installation costs.

Where It's Used

At least 15 firms already in production are expected to turn out 100 million feet of pipe for general use this year. Some firms roughly divide the sales pie this way: 60 pct agricultural, 9 pct line piping, 8 pct oil country goods, and 10 pct special fittings.

Installations for farm use are varied and include equipment for everything from cold water stock lines to jet wells. Steel companies who are getting interested in the newcomer can't afford to overlook the possibilities in line piping either. Increased use for city water systems, gas service lines, sewage disposal, irrigation and industrial lines is an established fact.

Although the market has plenty

"PLASTIC PIPE . . . has a very definite place in today's industrial picture."

of room for growth plastic pipe and tubing continues to falter when tested under high temperatures and pressures. A colossal market has hardly been touched in the plumbing field because temperature generally stops at 140°F. One successful temperature application currently is found in use of polyvinyl chloride tubing used in domestic water heaters.

Most Is Extruded

Steel firms who decide to go into plastic production will have to lick these basic problems before the sales potential can be realized.

There are at least four ways of processing thermoplastic pipe and two for producing fiberglass reinforced thermosetting pipe. By far the largest share of pipe production is by extrusion. And polyethylene and Eastman's Tenite (cellulose acetate butyrate) fill most of the requirements. These products are excellent in moderate temperature and pressure applications. They can withstand pressures ranging up to 100 psi.

Producers of Reflin (reinforced plastic) pipe say they have sold pipe for military uses which is satisfactory at temperatures ranging from −90° to +230°F. This pipe reportedly can withstand pressure as high as 600 psi. But cost is higher and some technical problems need to be solved to pave the way for big growth of this new product.

As steel launches its first marriage to plastic most observers are

IRON POWDER: Republic Enters Field

Republic Steel to produce iron powder commercially by newly perfected process . . . Will build semi-robot plant at Toledo . . . Process developed from direct reduction research.

Republic Steel Corp. will be the nation's first major steelmaker to produce iron powder on a commercial scale when its newly perfected process is installed in a plant soon to be erected in Toledo.

Plant will have a capacity of 50,000 lb of powdered iron per day, a substantial part of the country's production. Provision has been made for expansion to keep pace with expected market growth.

Build Near Hydrogen Source

Consideration is also being given to large-scale production of sponge iron by a variation of the process. This might be used for tool steels and similar high grade steels. And research in extracting nickel and manganese from low grade ores by the same basic process looks promising.

Republic will build its new plant on property recently acquired from Sun Oil Co.'s Toledo Refinery. Hydrogen, necessary for the powder-making process, will be bought on the spot by Republic from Sun Oil's new high octane gasoline facility, to be completed in October.

Completion of the powder plant is scheduled for summer 1954. Because the process is largely automatic and continuous, employment will probably not exceed 100 persons.

Strategic Location

Besides proximity to a hydrogen source, the new plant will be strategically located to serve the automotive industry in western Ohio and southeast Michigan. This industry has been and probably will continue to be one of the largest iron powder consumers. About 100 U. S. companies now produce iron powder gears and other precision parts.

"Maybe we could spot the trouble easier if we stopped the motor."

Republic will also market its powder for use in flame scarfing and cutting, looks for substantial sales to its own plants for this application.

Developed in connection with Republic's research on direct reduction of iron ore to high purity iron, the new process will use ores from the company's Adirondack and Liberian holdings. Republic started direct reduction research after acquiring its Adirondack orebody in 1938.

Try Radical Approach

The Adirondack ore, while relatively low grade, lends itself readily to beneficiation, has been used in Republic blast furnace burdens in this form for the last 15 years.

In 1948 Republic, in connection with Henry Crowley Co., Inc., West Orange, N. J., stepped up its direct reduction research program, attacked the problem from a radically new direction. After several years' laboratory study, a pilot plant was put into operation, ultimately produced substantial amounts of very pure iron powder on a continuous basis from any quality ore.

Uses Pulverized Ore

Although the direct reduction process proved eminently workable, it is not competitive costwise with conventional steelmaking techniques. But valuable experience was gained from this program and the new iron powder process developed.

Complete details of the powder making process were unavailable at press time, but Republic officials told THE IRON AGE that the process involves chemical reduction of pulverized ore.

Continued

wondering just how serious the development is. General conclusion is that steel firms are moving slowly in a field which should provide ample room for everyone. No one expects steelmakers to blossom out as full fledged operators for some time. Firms already entrenched in the field are ahead in experience, and their labor costs are lower than those companies in the metalworking trade.

Steel Has Sales Force

Plastics men also don't think there is much possibility of any steel firm setting up a vertically integrated operation in plastics overnight. Estimated initial cost for such an operation would run between $17 and $20 million. It would also involve competition with established chemical giants like du Pont and Carbide and Carbon who presently supply most of the raw material for processing plastics. Premium freight rates for shipping "air" may also keep the plastic pipe industry scattered in hundreds of small plants and tend to prevent integrated operation.

Can steel be successful with plastics on a smaller scale? As one plastics maker put it, "They have got sales organizations which can do things we never dreamed of."

House Passes Rubber Plants Bill

A bill (HR 5728) creating the machinery for disposing of 28 federal-owned rubber plants was passed late last week by the House and sent to the Senate.

On the Senate side, however, a committee was still holding hearings on its own bill (S-2047) looking to the same end.

STEEL: Get Rid of Nitrogen 'Curse'

Europe's Bessemer steel producers use oxygen in three processes to cut nitrogen content . . . Canadian firm pioneers "oxygen steel" in North America—*By W. V. Packard.*

Decision of Dominion Foundries & Steel Ltd., Hamilton, Canada, to pioneer North American production of "oxygen steel" in a solid bottom converter holds special interest for American steelmakers. It focuses attention on European improvements in Bessemer steelmaking practice.

European steelmakers, after many years of research and development, have apparently overcome the problem of high nitrogen content in Bessemer steel.

Found Out Too Late

Though Bessemer steel has long been noted for excellent machining properties, high nitrogen content has caused it to be susceptible to embrittlement as a result of strain age hardening. Consequently it has been considered unsuitable for many applications that require extensive working, forming, drawing.

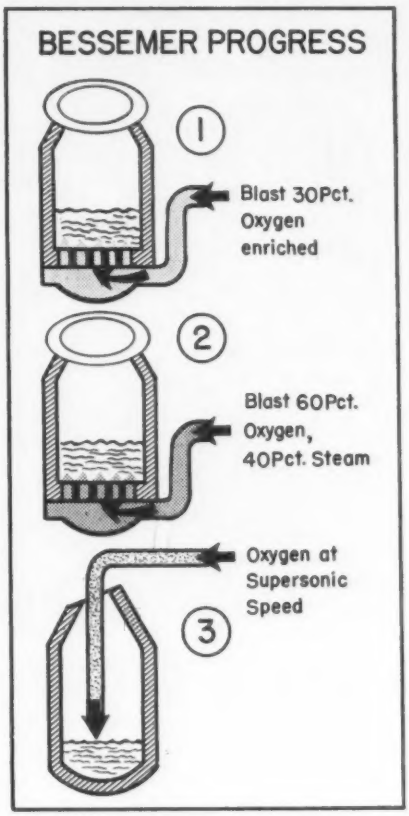
During time of steel shortage in this country some steel consumers have found out about these drawbacks too late—after they had bought some.

Now several European plants are commercially producing good quality carbon steel (with low nitrogen content) in basic or modified Bessemer converters.

Oxygen-Steam Method

Three methods, all utilizing oxygen, are being pursued. One method being used in a number of basic Bessemer plants enriches the blast to 30 pct oxygen. This shortens blowing time 30 to 40 pct and increases production 15 to 20 pct. The resulting higher temperatures permit larger proportions of scrap charge. But most important is reduction in nitrogen content in the steel to 0.007 pct average and 0.010 pct max.

Still lower nitrogen content is achieved by a second method. Developed in Belgium and Germany, this method employs a mixture of 60 pct high purity (95 pct) oxygen and 40 pct steam in the blow. Blow time is about the same as above. But scrap charge is only half that in a normal blow. Nitrogen content in this Bessemer steel averages 0.0020; maximum content is 0.0025 pct.



This steel, on cold-working and aging, hardens less than steels of openhearth quality, which usually have double this nitrogen content.

Imported from Austria

The third method of using oxygen to produce low nitrogen steel is the widest departure from classic Bessemer practice; even the name has been changed to "Oxygen Steelmaking Process." This is the process that will be employed by Dominion Foundries & Steel.

Thirty ton, solid-bottomed converters of simple design are used in two Austrian plants, first to employ the process. High purity (98 pct) oxygen is supplied by water cooled nozzles from a fixed but not critical point above the bath. Pressure of 85 to 215 psi blows oxygen onto surface of the bath at supersonic speed.

With a theoretical oxygen consumption rate of 1875 cu ft per ton of steel, actual consumption rate will be around 1950 cu ft per ton of steel, experience has shown. Blowing time is about the same as in conventional Bessemer practice.

Up to 20 pct scrap may be used in the charge, and charging temperature of the iron is no longer critical. This is due to higher temperature resulting from use of pure oxygen.

Composition of the hot metal charge may vary within rather wide limits. If high phosphorus iron is charged, dephosphorization is rapid, enabling the operator to "catch" the heat at higher carbon content. No after blow is needed.

Thrifty on Manganese

Reaction zone or "hot spot" is confined to a small area, thus helping prevent over-oxidation of the bath. Due to high finishing temperature, part of the manganese reverts from the slag, thus reducing the amount that would otherwise have to be added in the ladle. Very fluid bath permits non-metallics to rise to the surface, so ingots cast are relatively free of inclusions.

Nitrogen content of these steels rarely exceeds 0.005 pct.

Dominion purchased Canadian rights to the oxygen process from Brassert Oxygen Technik A. G. of Zurich.

None of the above improvements would have been feasible were it not for development of tonnage oxygen plants. Such plants either have been or are being installed at most steelmaking plants in Europe.

Processing native ores that are phosphoric and lean, Europeans have had to rely on Bessemer production because iron produced would have to be refined before becoming suitable for openhearth charge.

In the U. S. good ore has per-

mitted the openhearth to become the workhorse of the steel industry, producing good quality steel. Meanwhile Bessemer capacity has declined.

Openhearths will continue to produce the bulk of American steel for a good many years. But Bessemers are due for more attention now that the nitrogen "curse" has been overcome. Steelmakers are well aware of Bessemer advantages of high production at low cost.

Must Expand Metal Fabrication

Economic Commission for Europe is stressing the need for an expansion of metal fabricating industries to raise the income of European nations. "Without a substantial increase in engineering exports, the developed countries of Europe have little hope of achieving a lasting equilibrium in their balance of international payments" ECE states in its latest quarterly bulletin.

First step in the program to boost fabricated metal exports has been completed through expansion of steel capacity. ECE estimates that more than $1 billion has been invested in modern strip mills in seven West European countries. But the more difficult job of stimulating investment in production of finished household, farm and factory equipment remains.

The Iron Age

"Does it have the new Hypocritical drive?"

THIS PICTURE TELLS A STORY of a new cost-cutting opportunity for steel mills

Note the ready accessibility of each item of steel in this storage yard of a well-known steel mill. It's this availability of materials that's one of the prime advantages of the ROSS STRADDLE CARRIER handling method . . an advantage, unmatched by any other method, that eliminates delays, lowers costs and increases the production efficiency of the mill.

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MOBILAB: Test When, Where You Want

Fisher Scientific Co. introduces Mobilab . . . Will compete against expensive custom built labs on wheels . . . Industry need for portable lab seen rising—By T. Metaxas.

Stalled on a narrow country road was a $75,000 colossus of a mobile laboratory—custom built into a trailer at lavish expense in time and money. The lab had the equipment to do the job intended—but it did not have the maneuverability to get to the job site.

Fisher Scientific Co., in introducing its Mobilab to New York last week, claims it has surmounted the handicaps of extravagant cost and mobility. While the stalled colossus cost $75,000, the Fisher Mobilab sells at $24,800 for the special Chevrolet lab chassis and another $3000 or so for equipment. A general lab, fully equipped, costs $27,324.

Why Mobilab's Needed

Despite the "built to our needs" appeal of the tailormade lab it nevertheless has been assembled on a makeshift basis. The Mobilab is all specialist—from chassis to its unitized laboratory furniture engineered for fit and compactness.

Industry's need for the laboratory on wheels has been growing with the complexities of production, desire for ever rising efficiency and quality control, decentralization of plants and suppliers, exploration for new raw materials sources, and finally to cope with air and stream pollution.

Need existed before World War II, but little was done because compact, portable equipment, easily and cheaply installed, was just not available. A forceful shove to this development came from military services during the war. Needing mobile labs, they pressed for portable equipment—and now this equipment is available for industry's use.

Developing the first commercially available lab on wheels is no shot in the dark for Fisher Scientific. Before building the first demonstration model, it went cross-country on a 1½ year survey of custom built trailer and truck labs. Realizing that these improvised units are costly and often unsuitable, Fisher believes it has entered a basically untapped market.

Fisher engineers harped on rugged construction, maneuverability, self-sufficiency combined with a "unitized" flexibility of equipment adaptable to field work of any kind.

For ruggedness the Mobilab is built on an electrically welded channel steel framework covered with cold-rolled steel plate. Air conditioned for the summer, heated in the winter, the Mobilab is fully weatherproofed and insulated.

Utilities on Hand

Laboratory equipment to suit specific testing needs is ordered from Fisher Scientific's standard catalog, listing entirely prefabricated units which are bolted to each other and to the floor for rigidity. Space in the Mobilab is cannily utilized.

On roads where larger trucks or trailers fear to tread, the Mobilab's measurements of 25 ft overall, 8 ft wide, 10 ft, 10 in. clearance let it get through. By self-sufficiency Fisher means that power generators, water reservoirs, LPG gas tanks are stored under the lab floor. The Mobilab can subsist on its own for months.

Much interest for mobile laboratories has been generated by federal, state, and civil governments to check water supply. Civil defense will be another substantial customer.

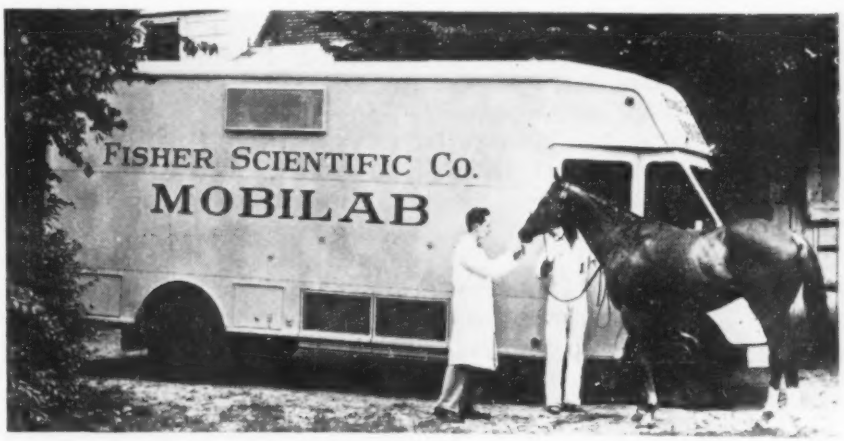
Today, industry's prime users of portable labs are petroleum companies which use them for continuing tests on drilling sites. Canners haul lab equipment to farm sites to test ripeness of crops. Picking at the peak of quality insures top grade labels.

Other Tasks for Lab

With the growing emphasis on quality control, Fisher foresees industry's interest in the Mobilab quickening. Quality control can be maintained right up the line—from the raw material stage through main plant and branch or supplier manufacturing. One inquiry to Fisher involves a plan to establish a laboratory consulting service whereby a Mobilab would serve several small manufacturers.

Other duties Mobilab can perform include plant production studies, methods standardization, industrial display of products with facilities to test them, corrosion studies, fuel testing, mine safety, well logging, ore testing, and condensate studies.

Fisher is also counting on ingenious businessmen to find their own uses for the Mobilab.



MOBILAB SHOWS VERSATILITY as it parks near racing stables to make prompt, decisive saliva tests. Track fixers watch out. Industry will put Mobilab to other uses.

GAS: Expansion Balloon Gets Bigger

Industry plans to spend $4 billion on construction in next 4 years . . . Natural gas accounts for 90 pct of outlay . . . Underground storage surges—By *E. C. Kellogg.*

In 940 B. C. the Chinese discovered the first commercial use of natural gas. Piping it through hollow bamboo rods, they used the gas to evaporate brine—a primitive process for producing salt.

From this ancient beginning until the late 1930s there was relatively little advancement of the natural gas industry as opposed to manufactured gas and the big push didn't come until after World War II.

Industry's Use Doubles

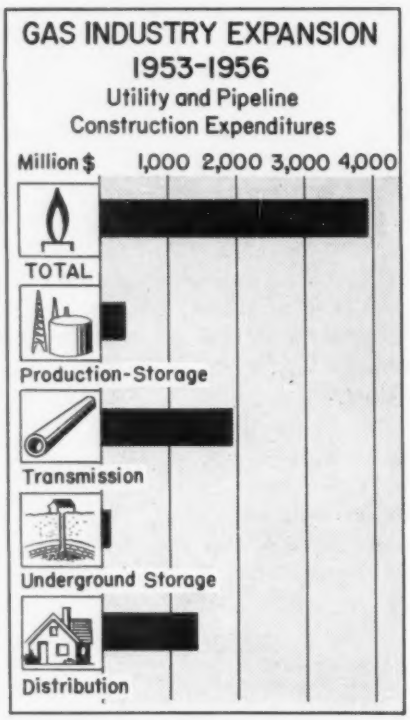
As a result of its tremendous expansion since the war, the gas industry (natural gas now accounts for more than 90 pct of total sales) is currently ranked among the nation's six largest industries. It has assets of nearly $12 billion, annual sales of more than $2.4 billion, boasts a customer list of 27 million.

Natural gas pipeline networks have more than doubled in the last 15 years, totaling an estimated 121,000 miles at the end of last year. New users are being added at a rate of nearly 1 million per year, and industrial use has doubled since the end of World War II.

Average Tops Billion

Indications are that the aggressive industry will continue operating on all burners. Survey by the American Gas Assn. shows that utility and pipeline companies will spend almost $4 billion for construction of new facilities from 1953 through 1956. Natural gas will account for 90 pct of the outlay.

Construction expansion, pressured by soaring residential and industrial demand for natural gas, has been moving at an annual clip of $1 billion plus since 1950, hitting a high of $1.4 billion in 1951. This year's outlay is estimated at $1.2 billion.



Almost half ($1.9 billion) of the planned $4 billion build-up will be spent for long distance pipelines. Expenditure for increased distribution through local gas mains is expected to be $1.4 billion.

In all, it is estimated that around 16,000 miles of pipeline will be laid during the next 4 years. Most important projects will be completion of gas transmission and distribution facilities in northern New England and installation of natural gas pipelines to the fuel-starved Pacific Northwest.

More Holes In Ground

Use of underground storage facilities has been a major development as the best solution gas utilities have found to the problem of meeting peak winter demand when home heating requirements send consumption skyrocketing. The industry expects to spend $134 million to build up its underground storage facilities during the next 4 years.

Current planned expenditures for underground storage by the end of 1956 are more than triple estimates made for the same period last year. Amount earmarked for expansion of underground facilities this year is $38 million.

Gas utilities will continue to be one of the steel industry's best pipe consumers. Petroleum Administration for Defense estimated the industry would need 10 million tons of steel and cast iron pipe from 1952 to 1955 to meet all requirements. For the 1953-56 period, actual consumption may be around 7 million tons.

Steel Use Dropped

Last year the industry used 1.7 million tons of steel pipe, a substantial drop from the 2.39 million tons consumed in 1951. Declines were most marked in the larger sizes of 16 in. and more, as only 1.18 million tons of large diameter pipe were used in 1952 as compared with 1.73 million tons in 1951.

AGA ascribes the decline in steel consumption to: (1) Completion of the majority of urgently needed large-size pipelines; (2) the steel strike; (3) abandonment of some expansion plans because of the steel shortage; (4) greater use of existing pipelines.

Rate Jump Coming

Industry sources told THE IRON AGE that recent steel price increases will undoubtedly mean requests for an upward revision of current gas rates. At the beginning of the year, the industry had filed applications for $156 million in rate increases with the Federal Power Commission.

Another offshoot of the natural gas expansion has been increased employment for dogs. One natural gas odorizing company is training English bloodhounds to detect leaks in transmission lines. Since natural gas is almost odorless, materials have to be added to odorize it. The company is hoping to develop a meat odor to stimulate interest of the gas hounds and is contemplating a switch to dobermans.

NICKEL: Slow Down to Take Stock

DMPA plans reach tentative goal . . . Supply will level off at not less than 167,000 tons by 1956 . . . ODM reviews needs . . . Nicaro plant may be boosted—*By R. L. Hatschek.*

Pausing in its rush to boost nickel supplies, the government is taking stock of goals and expansion of sources. With present and future contracted production, previously established nickel goals are scheduled to be met. Now Office of Defense Mobilization and Defense Dept. are reviewing military needs against supply. There is still a possibility of further expansion.

Pre-Korea consumption of nickel in the U. S. was about 100,000 tons annually. Increasing demand from all quarters had pushed up requirements to the point where Defense Materials Procurement Agency was shooting for a tentative annual supply of 190,000 tons by 1955.

Boost Supply 281,000 Tons

Demand today is intense and civilian consumers are being strictly limited. Platers, for instance, just won a boost to 30 pct of base period use. Even if military needs were trimmed substantially, civilian use would quickly swallow current supplies.

DMPA has been hustling for the past 3 years to increase nickel supply through expansion of private production. So far the agency has contracted for about 281,000 tons of nickel to be delivered over a 10-year span. Right now there are no further contracts under negotiation—but several possibilities are being explored. Decisions will have to wait for ODM.

Develop Only U. S. Lode

Many of the contracts will result in the production of nickel which otherwise might never have been brought to the surface.

One example is the agreement with National Lead Co. for 4631 tons of nickel, 3465 tons of cobalt and 3544 tons of copper to be extracted from rejected residual iron concentrates. Another is about 50,000 tons of nickel contained in ferronickel to be supplied by two M. A. Hanna Co. subsidiaries. This nickel will come from the only large (but lean) deposit in the U. S.—and would not be economical to mine without this contract.

May Hike Cuban Output

Second phase of nickel supply expansion is the Nicaro, Cuba, plant. Idle since World War II, this government-owned plant was brought back into production early last year. It is now producing at a rate of about 13,500 tons annually.

Current target of the plant based on present capacity is production of 15,000 to 16,500 tons annually. Facilities to produce over 25,000 tons annually may be installed.

Compare Techniques

This expansion hinges on whether or not sufficient local ore reserves are proved. Present reserves there total about 20 million tons. The goal is 40 million. Exploration is about half complete and confidence has been expressed that sufficient additional ore lodes will be found to justify expansion.

Another factor influencing the decision to expand Nicaro is the method of extracting nickel from lateritic ores. Investigations now in progress are comparing three processes: (1) the ammonia process now being used at Nicaro, (2) the nitric acid process, and (3) the sulfuric acid process.

Full expansion at Nicaro is included in meeting the current goal.

Reach Peak in 1956

Nickel from DMPA contracts is just beginning to come in but the flow will swell steadily from here on. Last year the supply totaled an estimated 110,000 tons from all sources except scrap, which totals about 10,000 tons in a normal year. This does not include the substantial quantity of nickel in stainless steel scrap.

The program will grow steadily, reaching a plateau of about 167,000 tons by 1956 and possibly another 10,000 tons or so more if Nicaro is expanded.

What this growth will mean to the civilian consumer of nickel in absolute terms is impossible to foretell because of military and stockpiling consideration. But the situation will surely improve.

Some improvement is expected as early as the fourth quarter of this year. And first quarter 1954 will be still better unless the military situation changes.

FUTURE NICKEL SUPPLIES

	(Net Tons)
1952	110,000
1953	118,000
1954	130,000
1955	160,000
1956	167,000
1957	167,000
1958	167,000

*Does not include possible expansion of about 10,000 tons per year at Nicaro or any further expansion plans of civilian producers.

Source: DMPA estimate

U.S. NICKEL CONTRACTS

SUPPLIER	TONNAGE (metal content)	DELIVERY PERIOD (approx.)
National Lead	4,631	1953-1958
Falconbridge	12,500—	1952-1956
	25,000	1956-1961
East Rim Nickel, Falconbridge	65,000 tons of ore	1953-1955
Milnet, Falconbridge	2,052	1953-1954
M. A. Hanna Co.	47,500— 62,500	1953-1962
Falconbridge	50,000	1953-1962
	50,000 (on option)	1962-1967
International Nickel	60,000	1953-1958
Pacific Nickel, Newmont Mining	21,000— 28,000	1955-1962

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—Purchasing—

PRICES: Competition

Purchasing men report stable price trend . . . Production in high gear . . . Backlogs slip.

Consumer resistance, high productive capacity and increasing competition in industry will minimize, perhaps even stave off any inflationary price spiral that might have been touched off by the recent steel price increase. That's the opinion of industry's purchasing men as expressed by the National Assn. of Purchasing Agents.

Industrial activity went into high gear early in June and the month ended at a still rapid pace. The early spurt was sufficient to assure steady shipments through the coming vacation periods. Although taking another dip in June, partially due to vacation shutdowns, order backlogs are still substantial, the PA's report.

June Grad Employment

The hot weather seasonal decline will probably come closer to normal than any time since the Korean conflict began, it's felt. Possible effects of peace or continued fighting seem to have been discounted by industrial buyers.

June graduates have slightly swelled total payrolls and a trend was noted leaning toward quick settlements in many wage negotiations.

Stocks of unworked materials in manufacturers' hands continue to decline and buying policy remains very conservative. There is no indication that purchasing executives foresee any radical shifts either up or down in the near future.

Aluminum, nickel, polyethylene, toluene and some steel items are still in the hard-to-buy category, while containers, copper and certain other steel items are easier to find.

With the important exception of steel, commodity prices have been showing a tendency to level off. Increases just about balance decreases with consumer resistance and keener competition hobbling price pressure.

Upward fluctuations were regis-

Checks Inflation

tered by abrasives, acids, ammonia, burlap, carbon, caustic soda, chlorine, gasoline (in some areas), lead, natural gas, sulfur, steel and steel scrap. Price reductions were scored by used cars, coal, food items, lumber, linseed oil, scrap paper, resin, soap, tallow, cotton yarn, tin and turpentine.

While industrial inventories generally showed a slight reduction, more firms showed some increase in June than in the past 2 months. Reason was to maintain working stocks during suppliers' vacation periods. Trend is to hold to the lowest operating stock since procurement time is short for most materials.

In line with this policy, the range of forward commitments has been reduced again. This is the most conservative policy reported for many months with 74 pct of the organization's members in the hand-to-mouth to 60-day groups.

Both production and order books are reported higher in Canada than in the U. S. Prices above the border have now reached U. S. levels in general. Employment is climbing and buying policies are a bit more extended. Industrial expansion is on the upgrade and business executives are optimistic —but cautious.

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Ore Crushing:

Inco's huge ore crushers smash 500 tons per hr.

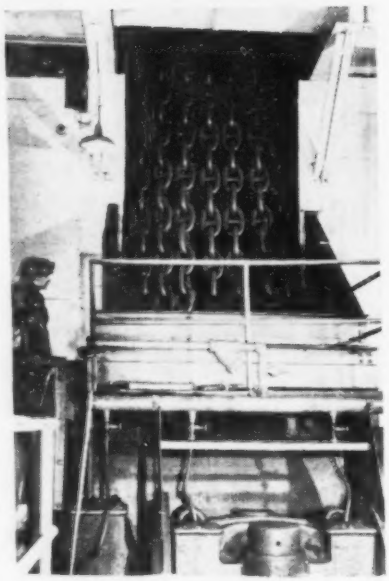
As part of its underground mining expansion program, International Nickel Co. installed five massive crushers in its Creighton and Frood-Stobie Mines in Northern Ontario, Canada.

Weighing 185 tons, one of these machines can crush about 500 tons of ore per hr, reducing it to 8-in. chunks. Ore dumped from haulage cars rumbles down a chute leading to the crusher which has a swing jaw weighing 18¾ tons.

Chains Regulate Speed

Speed of the ore feed to the crusher is regulated by seven large chains with 110-lb links. Total weight of the chains is 14½ tons. After passing through the crusher, the ore is ready to be hoisted to the surface for further processing.

Stations housing the underground crushers are located 500 to 5000 ft below the surface. Each station is lined with reinforced concrete and the back is supported by heavy steel beams.



Ease Alloy Steel Rulings

Upgrading of alloy steels will be permitted starting with June melts and National Production Authority estimates that such steel should be available for delivery in late July or early August.

Sec. 16 of M-1A, which prohibited steel distributors from ordering for placement in inventory specified commercial grades of alloy steel, has been eliminated through amendment of the order.

However, distributors' orders as well as others for alloy steel must still be listed on producers' melt applications to be screened before authorization is given to melt.

Defense Act:

DPA legislation snarled by rider on lending agency.

Congress last week was acting careless about Defense Production Act's expiration on June 30.

Principal obstacle to the lawmakers' agreement on S. 1081, a bill which would keep the act on the books, was a rider providing for creation of a new federal lending agency for small business. By a vote of 47-42, with the majority containing 43 Democrats, the Senate handed the bill and rider back to conferees representing both houses.

This move occurred despite Republican warnings that the delay would threaten existence of defense materials controls beyond June 30.

Earlier, the conferees found no difficulty in agreeing on a 2-year extension of government allocations and priorities authority over scarce materials.

The list of these items, a special responsibility of Commerce Dept. and its Business Services Administration, has just been reduced again. Only diamond grinding wheels, columbium-tantalum, and nickel were expected to remain in the "designation of scarce materials 1" category after July 1.

BSA Set for Aug. 1

Washington's new aid-to-business bureau, the Business Services Administration, is to begin operating as of Aug. 1, Assistant Secretary of Commerce Craig R. Sheaffer decided this week. The new agency had been scheduled to begin functioning on July 1. The month's postponement is needed to permit further consultation with industry groups and to complete staffing of the advisory agency, Mr. Sheaffer says.

National Production Authority, which was to have expired June 30, now has a month's reprieve and will continue a limited program of allocating steel, copper, and aluminum—plus advice—to industry through July 31, when the new agency will take over.

ENGINES: Output for Planes Tailspins

Slash production of Air Force jet and reciprocating engines . . . Slowdown in '52, now it's a cutback . . . Guess wrong on need for spare parts engines—By K. W. Bennett.

Actual aircraft engine production figures are "classified." But it is no secret that within the past few months, engine manufacturers producing jet or reciprocating engines under Air Force contract have been cutting back production by figures of from 25 to 50 pct.

One feeder plant for jet engine parts has been cutting back, is now at about 50 pct of the production it was scheduled to hit 2 months ago. Another has cut back 22 pct. One is on a part-time schedule.

Slowdowns Start in '52

The slowdown has already reached the small subcontractor. Raw material inventories are high, component parts inventories are strong, production lines are moving slowly, and skilled labor is becoming difficult to hold.

Initial slowdowns began in first quarter 1952, when engine manufacturers were notified of a "stretchout" which would extend the original date for maximum production to a point 12 to 18 months in the future. The effect was to reduce the going amount of subcontract business by about 30 pct.

The present 2-month-old cutback is more than a mere slowdown. Some plants have been given dates beyond which they will no longer produce engines. Others have been ordered to continue producing at the current rate but to produce engines for a shorter length of time. (In one case this is about 16 pct of the original production contract.)

Tools Falling Idle

One parts plant has begun operating for short periods. Designed to produce far more parts than are currently being consumed, the contractor finds it uneconomic to operate the full plant at a low daily production rate. Therefore he produces for short periods at full blast, then produces nothing for a short period. Although this may save money, it makes it difficult to hold a labor force.

Most plants were originally tooled for a higher production rate. With tools falling idle, Air Force contractors are wondering what will happen to the plants when they are no longer needed. Current production rates lead them to feel that such a date can't be too far in the future.

One plan calls for removing the tools from the plant where they have been used, storing them in integrated groups in some nearby area. In some cases this would require building storage facilities. Such a plan enables a skilled engine producer to lay his hands on the tools he actually needs

While this plan is better than the old system of central reserve pools established at the end of World War II, engine producers will point out that it still doesn't provide for care of the tool while it is in storage. The effects of bad storage on a machine tool can be deadly, and it was just such storage that was one of the contributing factors in the much publicized Army shell shortage.

It was economy that led to placing the tools into several vast storage pools after World War II. It was economy that reduced the funds to properly store these machine tools. Producers, who have created superb aircraft engine factories starting from scratch back in 1951, are hoping past mistakes will not be repeated.

It is generally agreed that to activate an aircraft engine plant requires about 18 months. Which means, in turn, that the plants that were beginning to set up production lines in early 1951 were ready for all-out action in the second half of 1952. Yet, in the first quarter of 1953, they were already slowing down, and some are now in danger of deactivation.

Why the slowdown?

Built Too Well

Industry and the Air Force did a good job of building engines. Their remarkable success hit Air Force schedules between the eyes. First, the quality of the engines produced was excellent. So excellent that the original estimate that one spare parts engine would be needed for each operating engine went astray. Engines proved so durable it was shown that only one spare must be produced for each *three* operating engines. This factor alone would reduce engine demand very considerably. On the basis of these figures, engine production could be reduced by better than 50 pct. Secondly there has been much reshuffling of production facilities. It was finally decided what engines were needed, making it possible to cut off engines declared obsolete. Plants producing obsolete engines were adapted to produce new engine types.

It is true that new plants are still being tooled to produce aircraft engines. On the other hand, unless some of the plants already producing are given higher schedules, they will be headed for the mothballs. The men who built them sincerely hope there will be money available for proper mothballing, not just enough to ensure a quick trip to the scrap heap later.

CENSORSHIP: Ease Washington Secrecy

Truman order allowing every bureaucrat to be his own censor will be eased by Ike . . . Only 16 department heads will be able to classify information . . . Means more information.

Sealed lips policy of the so-called Truman censorship order will be eased by President Eisenhower soon. For the past 22 months 29 different federal boards and agencies have held the right to arbitrarily stamp "Top Secret" and other security labels on information concerning government projects.

A great deal of useful information has been withheld from the public on the often indefensible grounds that it could in some way endanger national security.

"Restricted" Abolished

A partial lifting of this censorship policy has been ordered by the President to take effect on July 18. Heads of only 16 selected agencies will be permitted to classify genuine security projects "Top Secret, Secret, Confidential."

A former classification, "Restricted" (official use only) will be abolished and all information in that category will be made public.

For businessmen, the security easing will mean a noticeable opening up of all government sources of information. It should be easier to get more adequate replies from federal officials on such subjects as procurement, storage, money involved in contracts, and volume of products and services purchased.

Cover Up Mistakes?

Under the Truman order, such agencies as the Commission on Fine Arts, the Battle Monuments Commission, the Indian Claims Commission and 26 other boards had full authority to withhold information.

Mr. Truman always denied the order was used to cover up mistakes or to black out legitimate information, but the possibility for mis-use of the order always existed and proof of wrong-doing was almost impossible to obtain because of the gevernment's all-enveloping power to clamp the lid on any subject it chose.

Authority to restrict government information is to be limited to the heads of the following agencies: Civil Aeronautics Board, Defense Transport Administration, Dept. of Agriculture, Dept. of Health, Education and Welfare, Dept. of Interior, Dept. of Labor, Federal Communications Commission, Federal Power Commission, National Science Foundation, National Security Training Commission, Panama Canal Co., Post Office Dept., Reconstruction Finance Corp., Renegotiation Board, Subversive Activities Control Board, and Tennessee Valley Authority.

IRON & STEEL: May Output By Districts

As Reported to the American Iron and Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Number of Companies	Annual Capacity	PIG IRON May	PIG IRON Year to Date	FERROMANG., SPIEGEL & SILVERY IRON May	FERROMANG., SPIEGEL & SILVERY IRON Year to Date	TOTAL May	TOTAL Year to Date	TOTAL Pct of Capacity May	TOTAL Pct of Capacity Year to Date
Eastern	12	16,312,990	1,256,034	5,969,303	33,746	139,906	1,289,780	6,109,209	93.1	90.5
Pitts.-Yngstn.	16	28,643,120	2,383,893	11,599,970	29,114	173,578	2,413,007	11,773,548	99.2	99.3
Cleve.-Detroit	6	8,633,800	715,735	3,507,087	.....	.....	715,735	3,507,087	97.6	98.1
Chicago	7	16,251,250	1,370,356	6,508,132	.....	.....	1,370,356	6,508,132	99.2	96.8
Southern	8	6,020,380	477,771	2,381,297	5,173	30,190	482,944	2,411,487	94.4	96.8
Western	3	3,518,700	315,293	1,631,555	.....	.....	315,293	1,631,555	105.5	112.0
TOTAL	34	79,380,240	6,519,082	31,597,344	68,033	343,674	6,587,115	31,941,018	97.7	97.2

STEEL —NET TONS DISTRICTS	Number of Companies	Annual Capacity	TOTAL STEEL* May	TOTAL STEEL* Year to Date	TOTAL STEEL* Pct of Capacity May	TOTAL STEEL* Pct of Capacity Year to Date	ALLOY STEEL May	ALLOY STEEL Year to Date	HOT TOPPED CARBON INGOTS May	HOT TOPPED CARBON INGOTS Year to Date
Eastern	24	23,863,810	2,010,126	9,575,638	99.1	96.9	163,779	640,704	385,376	1,978,315
Pitts.-Yngstn.	35	43,621,000	3,653,055	18,286,636	98.6	101.3	578,192	2,789,756	443,350	2,323,458
Cleve.-Detroit	8	12,002,900	1,020,487	4,799,913	100.1	96.6	93,893	429,914	98,230	453,793
Chicago	16	24,960,600	2,208,657	10,524,514	104.1	101.9	173,865	794,999	340,075	1,606,362
Southern	12	6,036,160	493,873	2,400,870	96.3	96.1	4,636	25,428	6,628	22,271
Western	12	7,063,000	610,882	2,953,886	101.8	101.0	17,794	69,061	30,290	138,932
TOTAL	86	116,547,470	9,997,080	48,541,457	100.1	99.8	1,032,159	4,949,862	1,303,947	6,523,131

* Includes Alloy Steel, Hot Topped Carbon Ingots.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Grinder, drill, 155, $57,395, The Brown-Brockmeyer Co., Dayton.

Drill, pneumatic, portable, 4927, $134,199, The Arc Equipt Corp., Bryan, Ohio.

Sander, reciprocating portable, pneumatic, 842, $73,675, National Air Sander Co., Rockford, Ill.

Circular, saw, woodcutting, 93, $78,678, Dewalt, Inc., Lancaster, Pa.

Lathe, engine, general purpose, 39, $296,539, Bradford Machine Tool Co., Cincinnati.

Press, harbor, 419, $287,344, K. R. Wilson, Buffalo.

Machine, 259, $126,898, Accurate Parts Mfg. Co., Cleveland.

Grinding machine, 5, $133,615, The Heald Machine Co., Worcester, Mass.

Single cylinder surfacer, 56, $96,796, Powermatic Machine Co., McMinnville, Tenn.

Horizontal universal milling machine, 12, $96,000, The Kempsmith Machine Co., Milwaukee.

Valve refacing grinder, 234, $65,344, The Black & Decker Mfg. Co., Towson, Md.

Turret lathe, 7, $76,297, Warner & Swasey Co., Cleveland.

Tube bonder, hand powered, 2, $123,640, The Parker Appliance Co., Cleveland.

Portable elec-drills, 15232, $345,691, Portable Electric Tools, Inc., Chicago.

Drill, press, 432, $79,920, Noland Co., Atlanta.

Terminal box, 60000 ea, $69,000, The Palmer Electric & Mfg. Co., Wakefield, Mass.

Tools and test equipt, var, $145,230, Bendix Aviation Corp., Teterboro, N. J., *F. A. Battel.*

Instrument test equipt, var, $142,415, Specialties, Inc., Syasset, L. I., N. Y.

Generator for aircraft, 60 ea, $121,420, Bendix Aviation Corp., Teterboro, N. J., *F. A. Battel.*

Wire rope clips, 343000 ea, $77,625, W. J. Dunn Co., Inc., Boston.

Manometer, 38, $203,983, Ideal Laboratory Tool & Supply Co., Cheyenne, Wyo.

Head, metal parts for rocket, 667000 ea, $1,394,030, Hubeny Bros., Inc., Roselle, N. J.

Bomb, 25250 ea, $2,555,704, R. G. Le Tourneau, Inc., Vicksburg, Miss.

Bomb, demolition, 70000 ea, $9,352,700, R. G. Le Tourneau, Inc., Vicksburg, Miss.

Lathe, turret, 1 ea, $62,194, The Bullard Co., Bridgeport, Conn.

Truck, 7 ea, $57,610, White Motor Co., Los Angeles.

Dishwashing machine, 63 ea, $58,261, Stero Dishwashing Machine Mfg. Co., San Francisco.

Shell, HE, 81 MM, 80000 ea, $2,392,000, Kheem Mfg. Co., Burlington, N. J.

Parts for hart oil burning range, var, $285,128, Vulcan-Hart Mfg. Co., Louisville.

40 MM ammunition clips, 466671, $251,602, Electric Service Mfg. Co., Philadelphia.

the 3rd. DIMENSION

May be the difference Between PROFIT and LOSS

Here's how *MicroRold*® Stainless Steel *Saves You Money*

The third dimension, or gauge thickness, is extremely important in the purchase and use of stainless steel. Job costs are figured on a square foot of stainless area basis while stainless sheets are purchased on a weight basis. Each one-thousandth inch saved in thickness saves 1.26 pounds per sheet.*

When sheets are ordered by gauge number, the permissible A.I.S.I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge you may receive sheets .052″ thick, when a thickness of .0475″ would suit your purpose. Using a standard 18 gauge 36″ x 120″ sheet as an example, the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds.

MicroRold sheets may be ordered by gauge number and you may specify they be rolled on the light side of the gauge range. This is true because the company's equipment is such that more accurate control of thickness is possible.

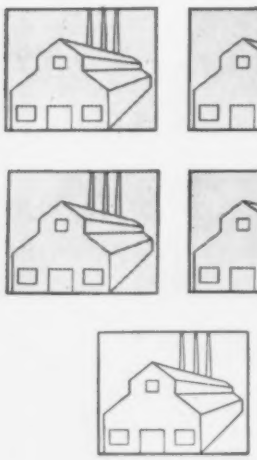
If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

**36″ x 120″ standard size sheet.*

WASHINGTON STEEL CORPORATION

Washington, Pennsylvania

4 out of 5



Since 1946, five major press plants have been built for the automotive industry to meet the increased demand for passenger cars and trucks.

Commercial Contracting Corporation was selected to install all machinery and equipment in four of these five plants.

Currently, CCC crews are beginning to place the first shipments of more than 1,000 pieces of equipment to be housed in the sixth such huge press plant constructed in the United States since the War's end.

Erecting heavy presses and other machinery is an important part of our business.

Other CCC services, provided individually or under one PACKAGE contract, include: General Construction, Building Alterations, Demolition, Foundations, Machinery Moving, Crane and Conveyor Installing, and Steel Fabricating.

COMMERCIAL CONTRACTING CORPORATION

GENERAL CONTRACTORS

12160 Cloverdale • Detroit 4

Industrial Briefs

Big Expectations . . . AMERICAN MANAGEMENT ASSOCIATION expects more than 2000 business executives from all parts of the country to participate in the 20-week fall program management seminars from Aug. 10, 1953 to Jan. 27, 1954.

New Plant . . . PETER A. FRASSE & CO., INC. held opening ceremonies recently at its new office and warehouse building recently constructed on Sheridan Drive, Tonawanda, N. Y.

Full Steam . . . ELECTRO REFRACTORIES & ABRASIVES CORP.'s Canadian plant at Cap de la Madeleine, Quebec, is operating at full capacity on a 7-day week for the production of silicon carbide.

New Home . . . ELLIOTT CO.'s Tulsa, Okla., district office has moved from 616 McBirney Bldg. to 910 Petroleum Bldg.

Tourists . . . J. R. Sweeney, president, PORCELAIN METAL PRODUCTS CO., Carnegie, Pa., welcomed the Senior class of the Scott Township High School when they visited the plant recently to see how porcelain enameled signs are made.

Face Lifting . . . PITTSBURGH STEEL CO.'s cold rolling mill in Allenport, Pa., has started on an improvement program which includes the erection of a new overhead travelling bridge crane and the addition of miscellaneous cold rolling and finishing equipment.

Exhausted . . . U. S. STEEL CORP.'s National No. 1 mine at Morgan, Pa. ceased operation last week and will permanently close down due to the exhaustion of coal.

To Construct . . . DRAVO CORP. will construct the main river piers for a new 1400-ft long highway bridge over the Penobscot River to carry traffic on U. S. Route 1 between Bangor and Brewer, Maine.

Guest Star . . . CHAMBERSBURG ENGINEERING CO. president Eugene C. Clarke presented a sound movie, "Drop Forging in Mid-Air" on invitation of the National Assn. of Drop Forgers & Stampers of England in Scotland recently. Movie shows Chambersburg Impacter (a hammer recently introduced in this country) forging knife handles and turbine blades.

The Winner . . . GENERAL MOTORS CORP. awarded the $1500 top New York State award in the General Motors Better Highways Awards contest to Chester L. Fisher, Jr., an attorney for Metropolitan Life Insurance Co. in New York.

New Furnace . . . GRANITE CITY STEEL CO., Granite City, Ill., tapped a second new 300-ton openhearth furnace for the first time recently.

For Sale . . . A PRATT & WHITNEY AIRCRAFT gas-turbine engine is being offered for sale to airlines in this country and abroad for the first time in the history of the company.

Big Move . . . N. RANSOHOFF, INC., has moved to a larger, modern plant in Hamilton, Ohio, from Elmwood, a Cincinnati suburb.

New Branch . . . WHEELING CORRUGATING CO., Wheeling, W. Va., has established a new branch at 1100 E. Holcombe Blvd., Houston, Tex.

Well Done . . . THE WARNER & SWASEY CO., Cleveland is the winner of 2 of 14 "Topper Awards" presented recently by the National Industrial Advertisers Assn. to "advertisers who in the opinion of the judges, have done an outstanding job of achieving specific objectives through the use of any or all forms of advertising or promotion."

Hear Ye . . . Wickwire Spencer Steel Div. of THE COLORADO FUEL & IRON CORP. has opened a new district sales office and warehouse in New Orleans with Ford L. Brooke as district manager.

Program Completed . . . THE BROOKS OIL CO., Pittsburgh, has just completed a modernization program designed to increase operating capacity of its plant by approximately 20%.

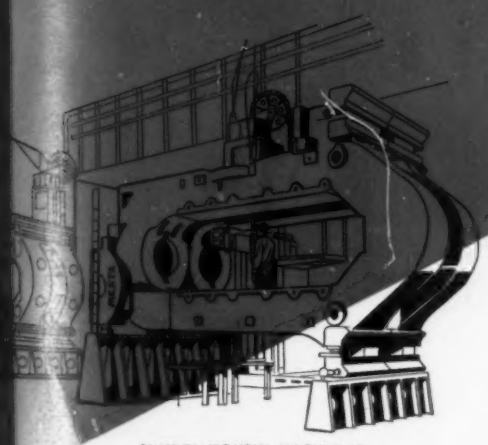
Gun Mounts . . . Metal Products Div., KOPPERS CO., INC. is producing combination gun mounts and recoil mechanisms for the 90 MM guns that help make the new Patton Medium Tank the finest of its type.

Organized . . . Norman J. Froelich, has organized the FROELICH STEEL SUPPLY CO., with offices in the Grant Bldg., Pittsburgh.

MESTA

HIGH-SPEED COLD MILLS

MESTA 56" FOUR-HIGH, FIVE-STAND HIGH-SPEED TANDEM COLD MILL INSTALLED IN A LARGE EASTERN STEEL PLANT.



SIMULTANEOUSLY MACHINING ROLLING MILL HOUSINGS IN PAIRS ON MESTA HEAVY DUTY DRAW-CUT SHAPERS

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Truck Output, Sales On Downgrade

Major producers cut back truck production . . . Two shut down lines completely . . . Borg-Warner, other supplier strikes cut parts stocks . . . But sales dip too—By *R. D. Raddant.*

Despite optimistic reports from the automotive industry for second half output, it appears that achieving any output records will be tough in truck production.

Strikes among supplier industries have hurt several truck producers badly, with one of the tightest pinches caused by the Borg-Warner gear strike. At least two companies have halted truck production entirely and major producers are making cuts.

Not Just Parts . . . But the slowdown in trucks is not entirely due to component troubles. Chevrolet has dropped from 7749 per week to 6100 per week in the last month. Ford, which blames mostly the gear strike, has fallen from 4800 per week to 4234. One week the plant produced only 35, due to the parts shortage. GMC has slipped from 2703 to 2221 in a 1-month period. Studebaker and Willys have dropped completely out of sight.

At least two larger producers have reduced their output in response to a reduced market demand. Their programs thus far have not indicated any upswing, as might be the case if parts shortages were the only reason for a cutback. For the entire industry factory sales of trucks in May of 93,493 had already fallen 26 pct or 33,295 units.

Auto Exports Off . . . At the same time, automotive export business for cars, trucks and buses, has fallen in the first 5 months of this year. Where 7.3 pct of total output went into the export market in the first 5 months of 1952, foreign buyers took only 4.8 pct of output this year, putting a greater number of vehicles into the domestic market.

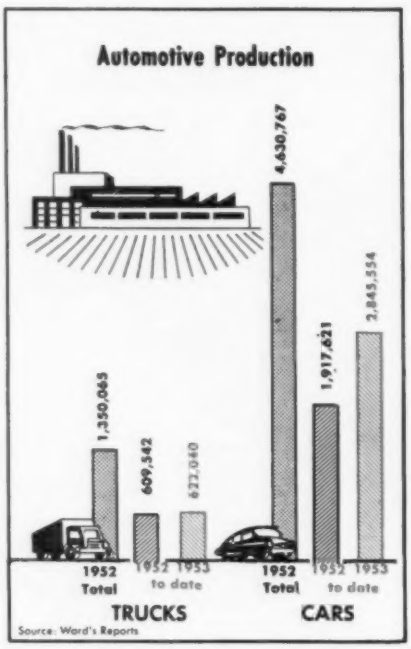
Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
June 27, 1953...	142,950*	17,587*
June 20, 1953...	141,460	17,030
June 28, 1952...	92,379	23,889
June 21, 1952...	101,422	27,931

*Estimated Source: *Ward's Reports*

Model changes, and some refurbished marketing plans, have been introduced and are hopefully expected to perk up sales before the end of the half. One line, for instance, is hoped will be pushed along at a better clip after several changes in engine design. Among the larger producers, the harbingers for the second half are dark.

Used Stocks Rise . . . A further depressing note was sounded by the latest National Used Car Dealers Assn. monthly poll. April sales across the country were off 6 pct from 1952 levels for the same month, while inventories as of May 1 were 4 pct over the same date last year.



Only area showing a sales increase was the Midwest. But, points out NUCDA President Ray Hayward, "many of these dealers indicate more wholesale activity but a declining number of retail transactions."

The 11-state western region showed a 1 pct sales rise, but also a 17 pct inventory increase over 1952. Both sales and inventories were below last year's levels in New England, the Middle Atlantic area, and the South.

"Watch Inventories". . . Commenting on the drop in sales and corresponding rise in inventories, Mr. Hayward said, "From the dealers' point of view this picture is not bright. Prices are continuing to decline, the tight-money policy is forcing sales resistance, and used car stocks are on the increase. All of this comes at a season of the year when, generally speaking, the used car business should be at its peak.

"We do not subscribe to talks of recession and the like, but when we advise dealers to watch inventories, it is only applying common sense. The turning point, July Fourth, is upon us. Add to this the tightening of credit conditions by financing institutions and the rapid flow of new cars into the market, it is only logical to assume that dealers are faced with conditions not experienced during the past decade."

The reports show that some dealers are anticipating a pickup in sales during the summer months. "Used car values have never been better, in light of lower prices and top quality late model cars on the market, and the buying public will recognize sound merchandising practices that highlight today's values," Mr. Hayward stated.

Willow Run Blues . . . The big story in Detroit last week was the

report that Kaiser-Frazer's giant Willow Run plant would discontinue manufacture of USAF C-119's, the cancellation of $205 million worth of defense contracts held by the plant, and the cutoff of jobs for more than 10,000 Willow Run workers.

Things had been looking dark for Willow Run since the Senate began its investigation of why the Kaiser Flying Boxcar (C-119) was currently being produced at a cost of $1,300,000 per plane. Fairchild Engine & Aircraft the senators claimed, was able to produce them at its Hagerstown, Md., plant at a cost of $260,000 per plane.

Edgar Kaiser told the investigating committee that Willow Run costs would eventually scale down to $253,000 per plane. The catch —820 or more planes would have to be produced at Willow Run before this cost figure could be reached. About one-third of Willow Run's plant area is being used for C-119 manufacture.

Work For Free . . . The Kaisers have received to date about $150 million on the Willow Run C-119 contract and another $70 million on the C-123 contract originally instituted by the Air Force with Chase, in which Kaiser now holds 49 pct of the stock.

The final curtain was being signalled with local Kaiser aircraft workers offering to work 30 days for free, if this would aid in holding the aircraft contract.

Ford Employment at Record High

Despite cutback reports with regard to trucks, and despite production difficulties due to strikes among component suppliers, Ford Motor Co. announced this week that employment for the firm was 186,560 persons employed in 33 cities.

This is a postwar employment high for Ford, and means that payrolls are running at an alltime peak of $956 million per year. Included in the total are 30,839 defense workers; 43,774 salaried employees; and 142,816 on hourly wages. Total is only 5000 below November 1943, highest employment month in company history and peak of World War II production.

French Get Republic Contract

As the USAF and its contractors held the headlines in Detroit last week, another aircraft producer made news when Republic Aviation announced a contract with a French firm (Societe Nationale de Constructions Aeronautiques Du Sud-Est), to produce spare parts for the Thunderstreak jet fighter.

The $30-million contract is first major subcontract to be let by Republic, of a series of contracts to be let abroad and the equipment produced will be shipped to countries participating in North American Treaty Organization agreements. The French firm, employing 8000 persons, is one of the largest in Western Europe.

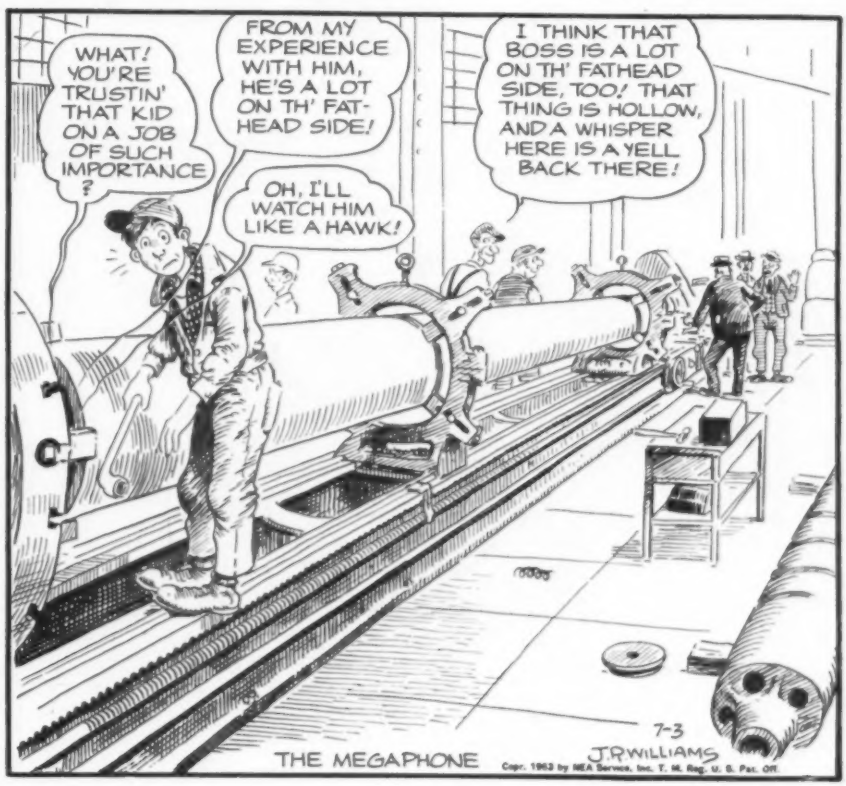
Said Republic Aviation Corp. president Mundy Peale, "This is but one more step evidencing continuing Franco-American teamwork in building a world free from fear."

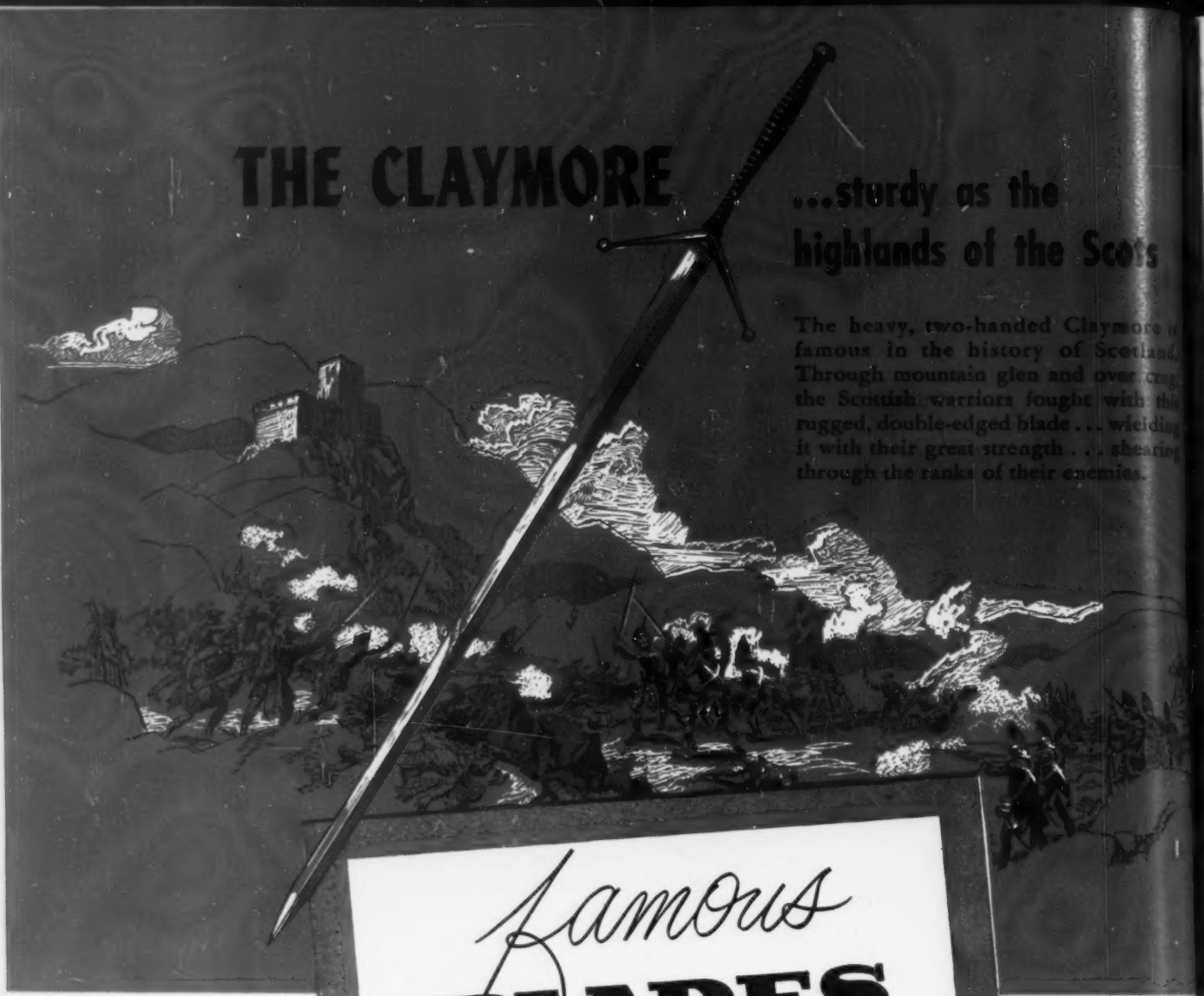
HUDSON JET Teacup Test promotion, used on dealer level, is designed to stress gas-saving feature.

Kaiser Makes Shift to Willys

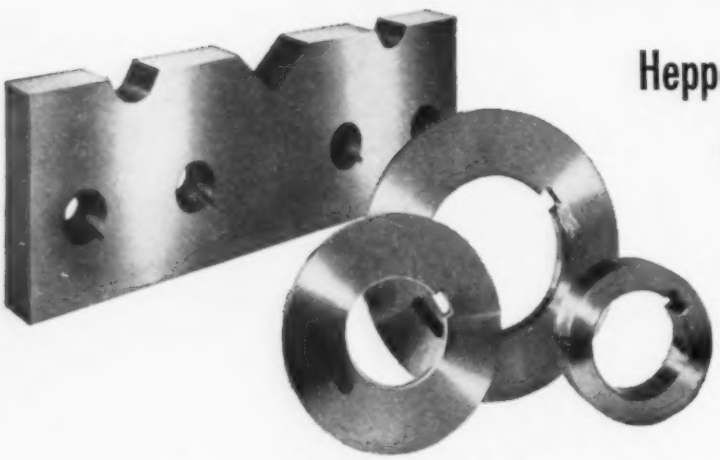
Kaiser Motors this week announced that several major automotive functions will be moved to Willys Motors, Toledo, the property that Kaiser acquired recently at a purchase price of $62 million.

THE BULL OF THE WOODS — By J. R. Williams


WHAT! YOU'RE TRUSTIN' THAT KID ON A JOB OF SUCH IMPORTANCE?
FROM MY EXPERIENCE WITH HIM, HE'S A LOT ON TH' FAT-HEAD SIDE!
OH, I'LL WATCH HIM LIKE A HAWK!
I THINK THAT BOSS IS A LOT ON TH' FATHEAD SIDE, TOO! THAT THING IS HOLLOW, AND A WHISPER HERE IS A YELL BACK THERE!
7-3
THE MEGAPHONE
J.R.WILLIAMS


THE CLAYMORE
...sturdy as the highlands of the Scots
The heavy, two-handed Claymore is famous in the history of Scotland. Through mountain glen and over crag the Scottish warriors fought with this rugged, double-edged blade . . . wielding it with their great strength . . . shearing through the ranks of their enemies.

famous BLADES



Heppenstall SHEAR KNIVES... do a sturdy job for industry

Exceptional service to industry is a reputation earned by the rugged qualities of Heppenstall Knives. Results that are measured in terms of greater productivity and lower costs are:

- MORE CUTS BETWEEN GRINDS
- MORE UNITS PER BLADE
- INCREASES IN PRODUCTION
- LOWER OVERALL BLADE COST

Make Heppenstall your standard specification for dependable Shear Knife performance.

Heppenstall

the most dependable name in forgings

PITTSBURGH 1, PENNSYLVANIA

Sales offices in principal cities.

New Hope For Legal Freight Absorption

FTC reverses its position . . . Bill has strong backing . . . The economic outlook stays bright . . . Pentagon spurs ammo output . . . Healthy postal increases sought—*By G. H. Baker.*

New life has been breathed into dormant legislation which permits producers of steel and other heavy industrial goods to absorb freight charges on the products they ship.

First real sign of life in the 5-year-old congressional proposal to permit limited quotation of delivered prices by manufacturers is sparked by the Federal Trade Commission's "change of heart" on the knotty freight-absorption issue. FTC, in a significant policy statement, now says it is legal and proper for a producer to pay freight charges, providing such payments are made in the absence of collusion with other firms and are made in good faith to meet competition.

Reverses Position . . . Previously the FTC held to be illegal all payment of freight by manufacturers, regardless of whether such absorption was practiced in concert by members of one industry, or individually by companies trying to maintain their competitive positions within their industry. That was the dominant view within the Federal Trade Commission from 1948, when the Supreme Court held the basing-point system of pricing to be illegal, until last week when Chairman Edward F. Howrey of the FTC outlined the new position of his agency in a letter to Senator William Langer, R., N. D.

As a result of the FTC's switch from its previous position, the Judiciary Committees of both the Senate and the House have now set to work to obtain action on the freight-absorption bills pending before them.

Good Chance Seen . . . Early action on the House bill (H. R. 4170) is now anticipated. Present legislative plans call for passage of this bill before the scheduled July 31 adjournment of Congress.

While there is considerably more opposition to the freight-absorption proposal in the Senate than there is in the House, proponents of the bill hope to gain enough new support during the months ahead to permit passage and approval by President Eisenhower early in 1954.

Business Looks Good . . . General level of U. S. business is still "strong," and inventories are moving into balance with sales, Administration economists believe.

Nearly all lines of trade enjoyed a Spring lift in sales, and manufacturers are selling nearly their entire output.

Stocks Aren't Loaded . . . Inventories of finished goods are comparatively small when compared with last October, November, and December, when production was running far ahead of consumption in a number of industries. Stocks now held by manufacturers, wholesalers, and retailers are valued at about $75 billion. And these inventories are generally balanced and roughly in line with sales, official tabulations show.

Output of manufactured goods is now at a rate 10 pct higher than at this time a year ago. Defense production increases are prominent.

Close the Barn Door . . . Army ammunition buyers are telling Congress the $3,395,000,000 tentatively earmarked for procurement of ammunition production facilities falls far short of meeting all-out war requirements. Jarred by recent congressional probes into Korean shortages, the Pentagon is now driving for a rapid build-up of inventories and capacity.

Funds now slated for ammo buying will permit production at the Korean rate of fire through December, 1954, plus building up of reserve stocks to a limited extent. But financing of production facilities will be held to about half of the total required for building production facilities needed to support all-out mobilization.

Mailing Cost Up . . . Business men, already scheduled to pay higher parcel post rates as a result of Post Office Dept. drive to become more self-sustaining, may be nicked again.

Congress has been asked to approve a hike in non-local first, second and third class rates.

Everything's Going Up

Last week Commerce Dept. reported that business activity generally is showing "moderate" increases for the second quarter, compared with first quarter.

Manufacturers' sales were up, employment was at peak levels, and business and industrial outlays for new facilities and equipment were higher than had been expected, Commerce economists say.

At the same time, the department's Bureau of Labor Statistics reported that consumer prices had edged up 3 points during the month ending May 15, primarily as a result of higher food costs. Overall, however, there isn't much change from some months ago.

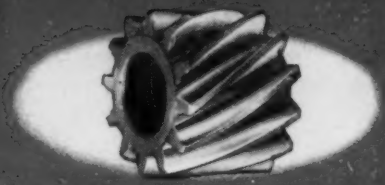
Also, BLS commented, consumer resistance to advances in prices is spreading to numerous fields, most notably in the housing and "important consumer durables" categories.

It was too soon to determine effects at the consumer level of the recent increases in steel and petroleum prices, BLS said.

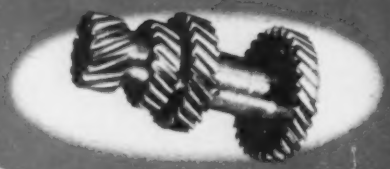
GEARS SHAVED in 12 to 20 SECONDS

Finishing precision gears to close tolerances on tooth profile, index, eccentricity and tooth surface smoothness on Red Ring Shaving Machines is a high production operation as indicated by these random examples.

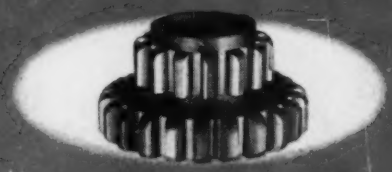
A SHAVING TIME 16 SECONDS



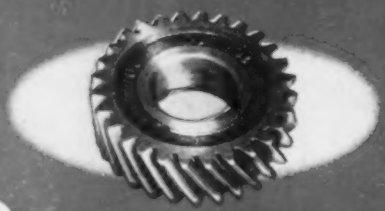
D SHAVING TIME 12 SECONDS



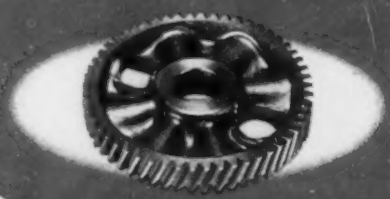
B SHAVING TIME 16 SECONDS



E SHAVING TIME 15 SECONDS



C SHAVING TIME 20 SECONDS

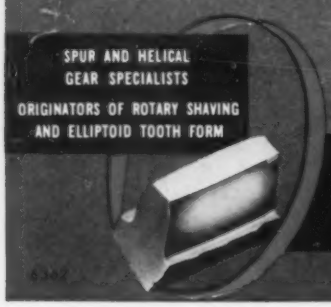


F SHAVING TIME 20 SECONDS

GEAR CHARACTERISTICS

Gear	Stock Removed Over Pins	Material	No. of Teeth	PD	DP	Face Width
A	.010"	Steel	19	2.4"	9.25	5/8"
B	.010"	Steel	29	4.00	9.25	1 1/16"
C	.010"	Cast Iron	28	2 3/16"	10	1 1/16"
D	.005"	Steel	12	1 1/8"	13.5	1"
E	.006"	Steel	14	2 1/16"	6/8	1 1/16"
F	.012"	Aluminum	54	5 7/8"	10	7/8"

WRITE FOR DESCRIPTIVE LITERATURE ON *Red Ring Gear Shaving*



NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN . . . . . DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

AID: Authorize $25 Million

MSA authorizes expenditures of $25 million for tools, machinery, vehicles, farm equipment . . . Italy's Fiat Co. gets largest single authorization . . . Big sum for French.

Makers of American machine tools, metalworking machinery, motor vehicles and parts, construction and mining machinery, tractors and agricultural equipment will benefit to the extent of more than $25 million worth of Mutual Security Agency authorizations during June.

In the customary rush to clear desks before end of the fiscal year, MSA approved procurement authorizations for more than $10 million worth of construction, mining and conveying equipment; $6 million worth of motor vehicles and parts; $3.6 million worth of machine tools; $3.5 million worth of tractors and agricultural equipment; and more than $1 million for metalworking equipment other than machine tools.

Will Make Jet Parts

Largest single authorization went for conversion of part of the Fiat Co., Italy's largest motor vehicle producer, to the production of turbojet engine parts.

Other projects ranged downward in size to $2,000 for purchase of a machine tool for Thailand.

Earlier this month, following selection of Fiat by the Dept. of Defense as a European supplier of jet parts for North Atlantic Treaty Organization planes, MSA said it would authorize up to $3.5 million for tooling up the Fiat plant.

Fiat's Procurement

Last week, the agency revealed that the overall procurement authorizations for Fiat would be broken down as follows:

Machine tools, $2,440,000; other metalworking machinery, $450,000; electrical equipment, $240,000; and miscellaneous items, $340,000. About $230,000 will be allowed for ocean shipping.

Fiat has already benefited from Marshall Plan-Mutual Security financing to the extent of $31 million which was used to modernize the firm's steel and automobile plants.

June authorizations bring total approved procurement of machine tools under ECA-MSA to more than $260 million, early figures indicate. About 75 pct has been shipped and paid for.

Including June authorizations, total approved procurement of construction, mining, and conveying machinery and equipment since April 1948 amounts to approximately $250 million.

French Get Most

Among the more sizable June authorizations in this category were: France and French colonies, $4.850 million; Turkey, $2.350 million; and Indo-China, $900,000. Formosa received $125,000.

Authorized procurement of motor vehicles and parts, okayed during June, brought the cumulative total since beginning of the Marshall Plan to something more than one-quarter billion dollars.

NEW CHAIRMAN of Atomic Energy Commission is Lewis L. Strauss, New York financier and rear admiral in the Naval Reserve.

Nearly one-half of the June authorizations, or $2.7 million, was allotted to France and her possessions. Belgium-Luxembourg, the biggest motor vehicle customer under ECA-MSA (about $110 million), was allotted $500,000 more during June.

Aluminum:

New committee is formed to watch aluminum distribution.

Now that the Controlled Materials Plan is defunct, General Services Administration is set to ride herd on primary aluminum production to make sure nonintegrated fabricators are not overlooked in distribution of the anticipated tight supply.

Last week GSA set up an interagency committee under Frederick W. Witt, GSA Emergency Procurement Service, as a go-between to help producers and fabricators divide production from expanded facilities.

Has Some Control

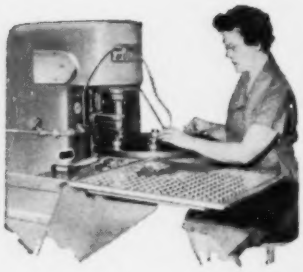
Under the new Defense Materials System, the government has no jurisdiction over production from facilities in existence before the expansion program. The government can only require set-asides for military and defense orders.

But GSA does have supply contracts in connection with most of the aluminum expansion projects which have been certified for rapid tax amortization. There is a provision in these contracts which requires that for a period of 5 years, two-thirds of the production from the expanded facilities—less amounts taken for the stockpile—must be offered first to nonintegrated fabricators.

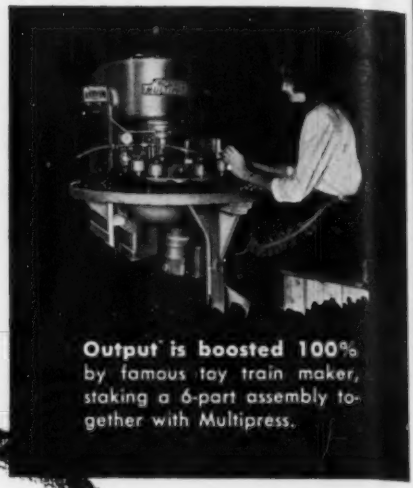
This provision was non-operative under CMP. But with the end of government allocation power, GSA has called up the "sleeper" provision and will now enforce it.

As a liaison unit, the new committee will work with both producers and independent fabricators to determine how much aluminum will be available each quarter after the stockpile take is deducted. It will also assist in distribution plans.

Assembly speed is doubled using Multipress to crimp a small brass contact to pen-type flashlight cases.



Scrap losses drop sharply as Multipress doubles staking speed on high precision voting-machine counter wheel assembly.



Output is boosted 100% by famous toy train maker, staking a 6-part assembly together with Multipress.

MULTIPRESS® DOUBLES PRODUCTION SPEED

On Six More Typical Operations

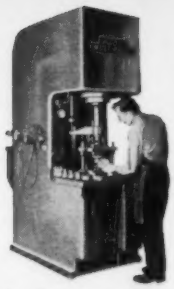
Faster production, better quality, less scrap, safer operation, easier handling, quieter action, and other profit-boosting results are run-of-mine with Multipress.

In the six cases shown here, Multipress *doubled* production rates. Hundreds of other reports tell of gains ranging up to 8 and 10 times the speed of previous equipment.

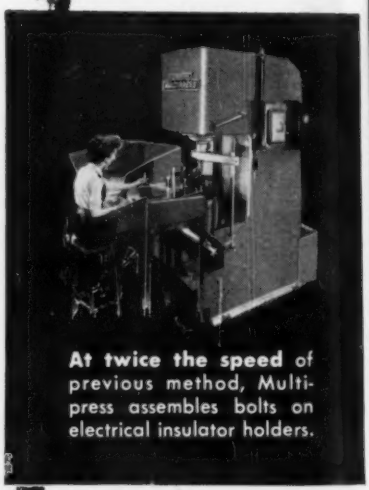
How does Multipress do it *so consistently?*

It is uniquely engineered to provide the smooth, controlled action of oil-hydraulic power *at its versatile best!* Infinitely adjustable ram pressures and stroke length make it easy to eliminate all unnecessary ram *travel* and ram *effort. Controlled* ram speed eliminates hammer-blow impact, cuts wear and tear on tooling, and permits better metal flow.

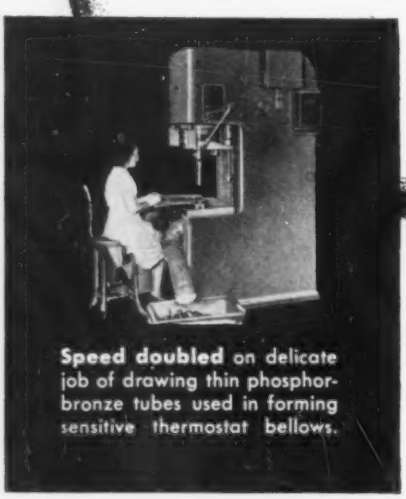
Multipress also offers standard attachments for extra efficiency on most production needs. It is easily equipped with automatic feeds, indexing tables, ejection devices, auxiliary ram actions . . . controls for automatic time-delay, hold-down, vibratory pressure application, sequence operations, etc. Multipress offers nine frame sizes . . . one-ton to 75-ton capacities. Write for details!



In only four stages, Multipress deep-draws a precision ordnance part formerly requiring 8 draws.



At twice the speed of previous method, Multipress assembles bolts on electrical insulator holders.



Speed doubled on delicate job of drawing thin phosphor-bronze tubes used in forming sensitive thermostat bellows.

DENISON Hydroilics

The DENISON Engineering Co.

1158 Dublin Road, Columbus 16, Ohio

Coast Steel Sets 6-Month Records

Western steel mills well past halfway mark to area's first 5-million ton year . . . Output could reach 5.5 million tons at present rates . . . Some items softer—*By T. M. Rohan.*

The steel industry of the seven western states this week chalks up its biggest 6-month period in history.

Ingot tonnage poured through June is 2,760,000 or well over the halfway mark toward its first 5-million-ton year. Tonnage in strike-bound 1952 was 4.5 million, and peak '51 was 4.8 million.

Above Predictions . . . At the beginning of this year western steelmakers' estimates indicated 1953 tonnage would be 5.2 million. But if current demand holds, it could hit 5.5 million at present operating rates.

A few holes are opening up, however. The reinforcing bar market—first to slip in a normal market because of excess capacity—has shown lower demand for late July and August. Some mills, where possible, are being shifted to other products to take up the slack. Current construction strikes are also clouding the re-bar market and jobbers are placing reduced orders.

Third Quarter Solid . . . Largest mills are heavily booked through the third quarter. Fourth quarter rolling schedules will not be open until late summer except for Defense Materials System, which will be earlier. But runover and commitments promise at least near capacity operation through the year with improved efficiencies.

For western plants DMS tonnage is not in excess of 10 pct against as high as 30 pct nationally for some finished products such as alloy bars.

Set Ingot Records . . . Bethlehem Pacific has been hitting new ingot production records almost monthly this year. In May it set a new record of 87,265 tons for the Los Angeles, San Francisco and Seattle plants.

U. S. Steel Columbia-Geneva production has also been consistently high. An increasing percentage is going into the expanded electrolytic tinplate mill at Pittsburg, Calif., which is staying close to 900 fpm.

Kaiser's production has hovered at capacity output through this year and officials look for a good fourth quarter.

Sales at Peak . . . Two major steelmakers close books this week on their best fiscal sales year in history. Colorado Fuel & Iron Corp. at Denver expects the total will hit $245 million compared to $195.8 million last year. Kaiser estimates $134 million against $118 million last fiscal year.

The C.F.&I. figure includes part of last year's strike period as well as 6 months' sales by J. A. Roebling's Sons, bought Dec. 31, 1952. C.F.&I. expects capacity production through the year. Early next month it will start test runs on its 327-million seamless tube mill with formal opening in October.

Rails & Bars . . . Rail and rail supplies continue to roll as does the reinforcing bar market.

Lowered farm income has meant more sales effort but demand is still holding up well. The third quarter is solidly booked and Pres. A. F. Franz is optimistic about a healthy fourth quarter.

Kaiser's profit is expected to drop from last year's $10.4 million because of accelerated depreciation charges. Costs of start-up and breaking in on the new tinplate mill also hit $7.6 million for the first 9 months. But return is expected heavy this year with sustained high tinplate demand.

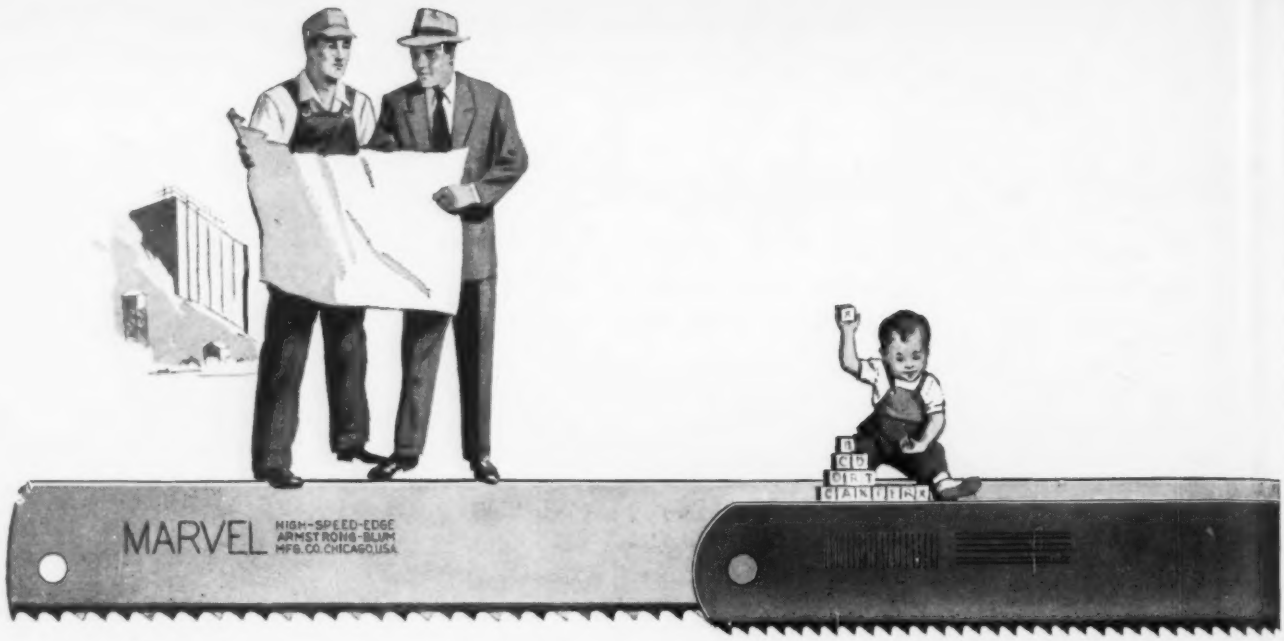
Inverted Girders . . . Gunderson Bros. Engineering of Portland, Ore., this week is putting final touches on its upside down girder bridge for the Hood river.

Part of the new Columbia river express highway, the bridge has approaches on two different grades with a curve thrown in. To avoid a mass of calculations on setting the camber, sections were set upside down in the fabrication shop to get a natural camber and every point on the bridge shot from underneath.

Shot to Camber . . . Every elevation had to be shot to camber and all pieces machined to fit, hardly any two alike. Conventional method is laying girders on sides, setting camber, then assembling right side up, if stipulated in the contract, or shipped for field assembly.

The bridge extends 368 ft and is 32 ft wide between girders. Total steelwork tonnage is 185. Two sections have been barged up the Columbia river to the site and placed.

Planners' Plans . . . Steady steel industry expansion is giving municipal planners plenty to do these days. In San Francisco last week the American Institute of Planners considered the impact of the Fairless Works and National Steel's proposed Trenton Works.



. . . *but*
Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate — without the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!

MARVEL *Metal Cutting* SAWS

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Won't Pass on Materials Increases

Drop in new orders seen as indication that builders will not try to pass on increased materials costs . . . Backlogs drop to 7.6 months . . . Civilian market strong—*By E. C. Beaudet.*

A look at the May index of machine tool orders and shipments almost certainly rules out across-the-board price increases for machine tools. Recent hikes in steel products and wages will result in higher costs for builders, but it is not expected that these increases will be passed along to customers.

Reason of course is the general falling off of new machine tool orders. During May the index of new orders fell to 276.8, about 30 points below the April level. Backlogs slipped under the 8-month mark for the first time in several years.

Backlogs Vary . . . While overall industry backlog average 7.6 months, some firms have orders for only 3 and 4 months ahead. Other backlogs range from 8 to 10 months.

Companies with larger backlogs and higher inventories, particularly of smaller parts, will not feel the pressure of price increases before the end of the year. Nor will larger parts, usually bought on a shorter basis and made mainly of iron, be affected so much.

Builders with backlogs of 6 or more months in the majority of cases can take advantage of escalator clauses in contracts to recover increased costs. While list prices of equipment may not change, price paid will be more.

Will Price Go Up? . . . Some customers are already starting to ask whether escalator clauses will be enforced because of materials increases. The policy seems to be that if equipment to be delivered is made of materials in inventory before price increases, the escalator clause will be waived. If not, prices will be upped.

Companies with shorter backlogs and lower inventories will feel material cost increases more quickly, but their low backlogs will also make them more sensitive to competition and reluctant to raise prices.

Pay Labor More . . . Signing of the steel labor pact will undoubtedly result in higher labor costs. Major unions will be quick to follow the example of the steel industry. To maintain their labor forces machine tool builders will have to go along with the rest of industry and pay more.

The slip in orders during April and May indicates the upsurge of buying at the beginning of the year has been reversed. Earlier, the general easing of industry controls brought deferred civilian buying into the open. New orders climbed steadily from December through March as declining defense orders were offset by increased civilian demand.

NEWLY APPOINTED as director of the Metalworking Equipment Div. of NPA is Perrin G. March, III, President of Cincinnati Shaper Co. He replaced Earl P. Leeds of Brown & Sharpe Mfg. Co.

Couldn't Stop Drop . . . However, this trend didn't last too long—nobody expected that it would. Stepped up civilian ordering couldn't stave off the drop in government defense buying indefinitely.

At present civilian orders for machine tools are strong and well diversified. Although the largest single customer of the industry so far this year has been automakers, builders report they are receiving inquiries from a wide range of industries such as oil field equipment makers, farm implements and appliances.

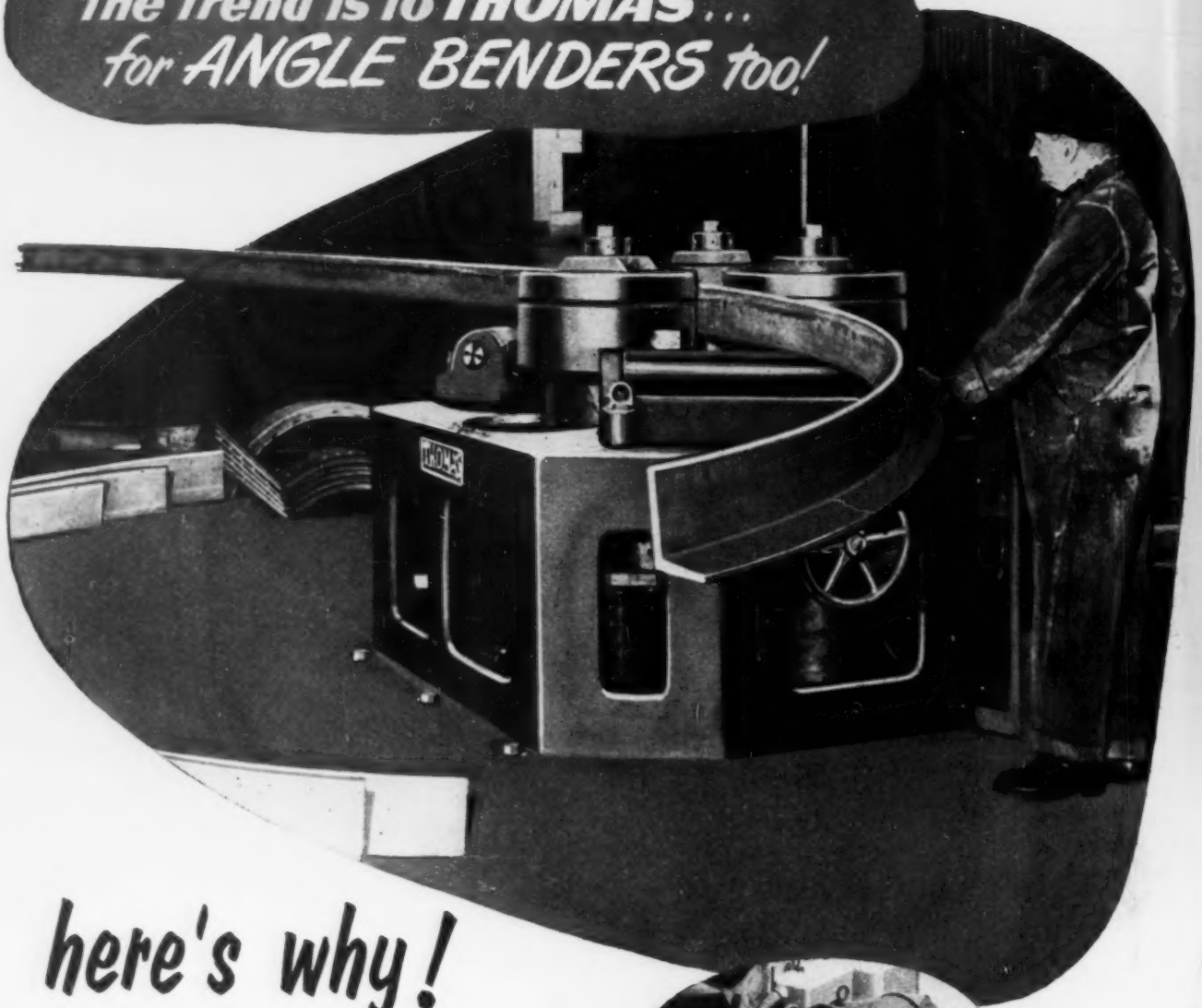
Auto Need Ebbs . . . While automotive orders loomed large during the first 6 months of 1953, a seasonal drop is now taking place. Most of these orders were for 1954 models. A lot of engineering now going on in Detroit for 1955 models will result in an order pickup from the auto industry in the last quarter of this year and the first quarter of 1954.

In view of the lesser role being played by the government, some builders who have not yet been forced to lower production are planning cutbacks this year. A drop in manufacturing hours does not necessarily mean abandonment of facilities. In some cases it will result in a reduction of shifts or fewer subcontracting arrangements.

Higher Profit Margin . . . In these instances profit percentages may be improved due to dropping night shifts which require premium rate wages. Builders with less healthy backlogs, of course, will suffer more immediately from production cutbacks.

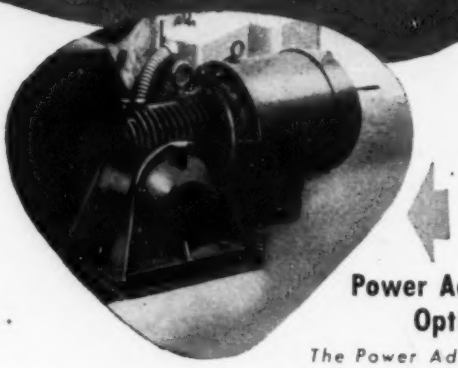
One of the major problems facing the industry is what to do with its increased capacity which has risen 28 pct in the last year. Total since Korea is much greater.

the trend is to THOMAS ... for ANGLE BENDERS too!



here's why!

1. *All-steel* welded construction . . maximum strength with minimum floor-space required.
2. Furnished complete for leg-out or leg-in angle bending . . *no extras to buy!*
3. Quick roll adjustment for width of slot . . quicker change-over.
4. Special roll combinations available for beams, channels, flats, pipe, etc.
5. Usual Thomas ruggedness and dependability, as found in all Thomas metal-working machinery.



Power Adjustment Optional

The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

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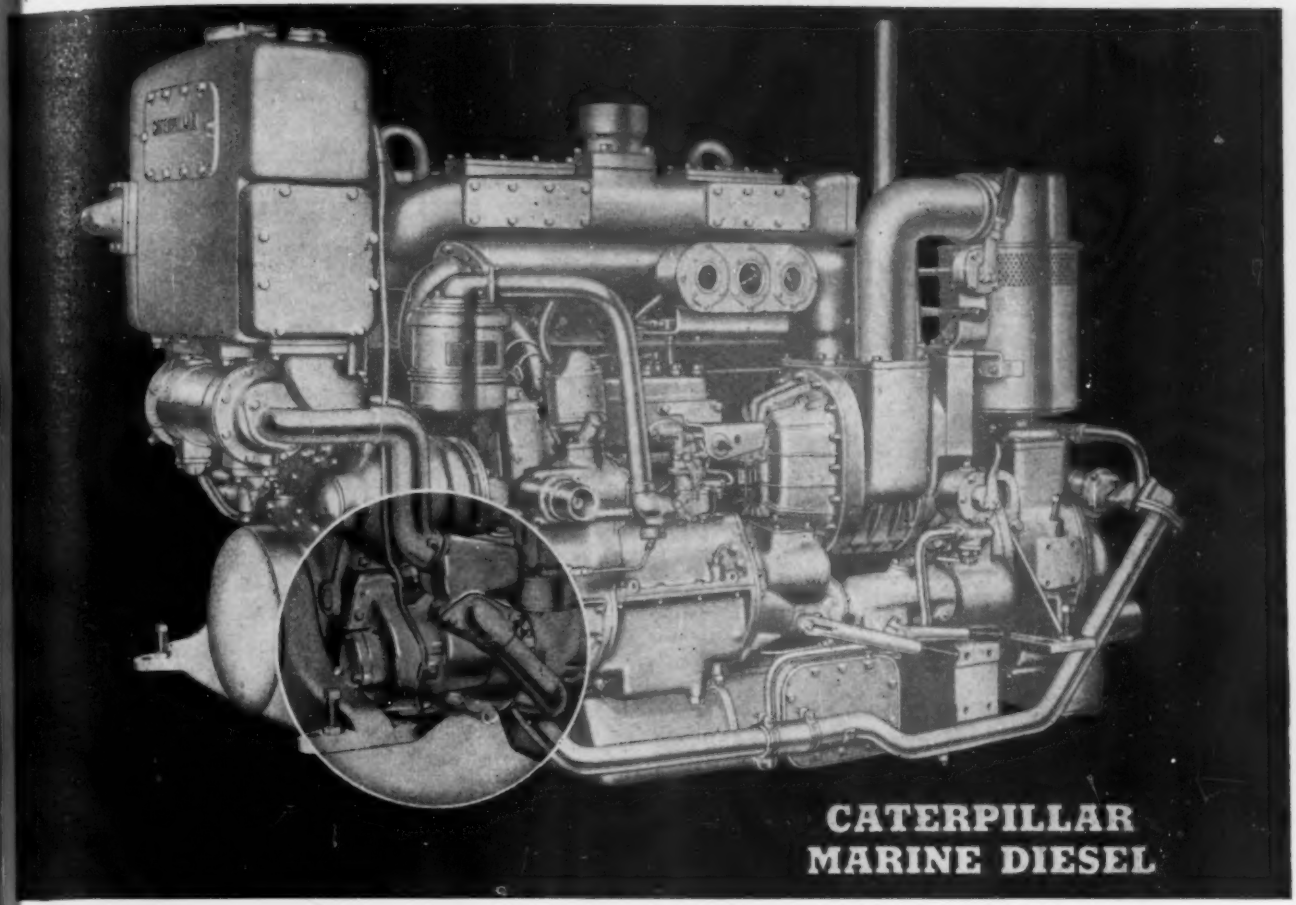

National Bearing Castings Help Cool "Cat" Engines

National Bearing Division's foundry skill permitted a new design in pump efficiency and compactness.

This extremely compact 170 horsepower Marine Diesel Engine, with special coolant pump, is a new design in efficiency by Caterpillar Tractor Co., Peoria, Illinois, makers of famous "Caterpillar" Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

Unusual size restrictions were specified in the coolant pump housing. It had to be of tough, durable bronze, highly resistant to corrosion by raw sea water, and painstakingly cast as the housing component for a very compact coolant pump, capable of delivering 100 gallons per minute. The housing casting design was unusually intricate, with wall thicknesses exactly ¼" in some areas, 7/32" in others. The mold for each casting required *14 cores*—all perfectly positioned, as the slightest misalignment would be ruinous. And, housings had to be cast to minimize machining.

"Caterpillar" selected National Bearing Division to provide these special bronze pump housings. We were chosen for proven ability to produce top quality castings, our unique core facilities, and our experience in applying over 50 years of specialization to customers' problems.

Our bronze pump housing castings met—and continue to meet — "Caterpillar's" specifications for quality, tolerance, and minimum machining in every respect.

If your product includes copper, bronze, or other copper-base castings, it will be worth your while to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

Write to National Bearing Division for complete information and your copy of our catalog.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4923 Manchester Avenue • St. Louis 10, Mo.

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Gear problems?

—check with FAIRFIELD

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FAIRFIELD is one of America's largest independent producers of precision cut, automotive type gears such as are being used today in ever-increasing numbers in Agricultural Implements... Power Shovels . . . Machine Tools . . . Diesel Locomotives... Road Graders... Lift Trucks . . . Road Rollers . . . Pump Drives . . . Winches . . . as well as in Trucks, Tractors, and Military Vehicles.

Fairfield's facilities are unexcelled. Here "under one roof" in a new and ultra modern plant designed especially for the purpose, Fairfield has everything needed for producing *fine gears* EFFICIENTLY, ECONOMICALLY. *Call or write for information TODAY.*

Fine Gears made to order:

SPIRAL BEVEL • STRAIGHT BEVEL • HYPOID
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—Free Publications—

Continued

Groove gage

Bryant Chucking Grinder Co. has released a specification sheet on its new, portable groove gage, designed for checking the diam and roundness of internal grooves. The adjustable gage covers a range of groove diameters up to 5 in. and can be used to check grooves located to a depth up to 1 or 2 in. from a face, depending on the diameter of the groove. Further details are given in the specification sheet. *Bryant Chucking Grinder Co.*

For free copy circle No. 13 on postcard, p. 103.

Cold bending

Hot Tips on Cold Bends is a valuable reference folder for use whenever a question arises concerning cold bending of aluminum. The folder, supplied in the interest of good shop practice by Kaiser Aluminum and distributed by Korhumel Steel & Aluminum Co. contains a table of recommended minimum radii for cold bends in various alloy and temper aluminum. *Korhumel Steel & Aluminum Co.*

For free copy circle No. 14 on postcard, p. 103.

Grinding

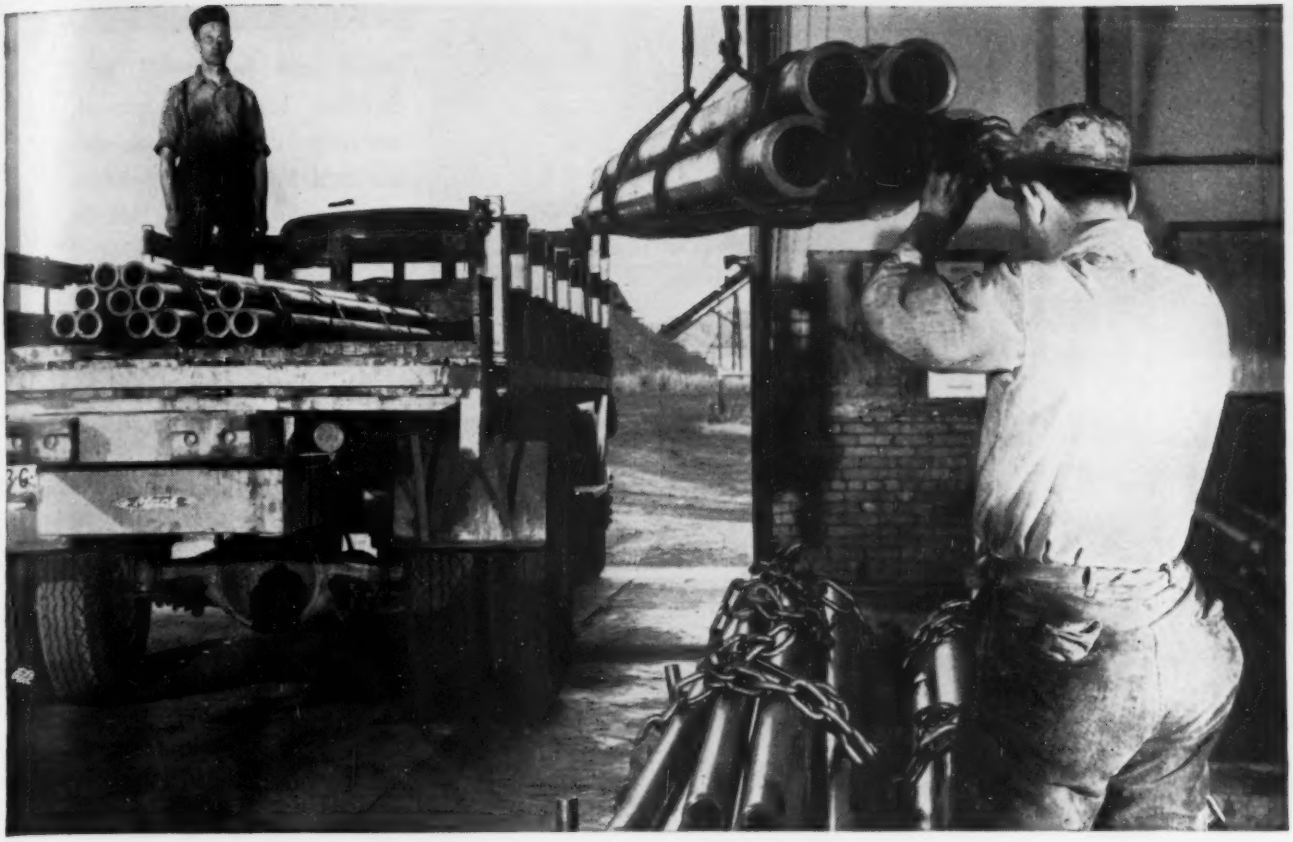
Landis Tool Co. reports demand for its *Better Grinding* booklet, first offered last year, was so great that a second printing was needed. Copies are now available. The 84-p. booklet is packed with valuable details on how to set up grinding jobs and how to operate precision cylindrical grinders. There is also information on the proper care of cylindrical grinders and how to turn out better grinding jobs. *Landis Tool Co.*

For free copy circle No. 15 on postcard, p. 103.

Handling equipment

LiveRail wheel conveyors are available for fixed or portable package handling and to solve special handling problems. Photographs of varied applications and complete information on these conveyor systems is given in a new brochure. *Alvey-Ferguson Co.*

For free copy circle No. 16 on postcard, p. 103.



52100 tubing shipped within 24 hours after you order!

GOT a rush hollow-parts job? The Timken Company will ship less-than-mill-quantities of 52100 tubing within 24 hours after receipt of your order.

Timken® 52100 steel will do most of your hollow-parts jobs. It can be heat treated to file hardness and tempered back to any desired point. A high carbon steel, it is through-hardening in moderate sections, has high wear resistance and can often be used in place of more expensive steels. And it comes in sizes from 1″ to 10½″ O.D.

Here's a partial list of hollow-parts jobs for which Timken 52100 steel is used: aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts and precision instruments.

The Timken Company's unmatched experience, as a pioneer producer of 52100 tubing, has resulted in uniform quality from tube to tube and order to order. Rigid quality control checks every step of production.

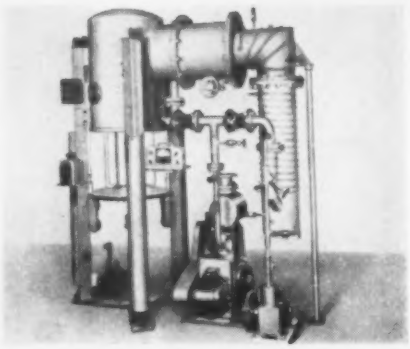
For immediate delivery of your less-than-mill-quantity orders, write, wire or call The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

NEW EQUIPMENT

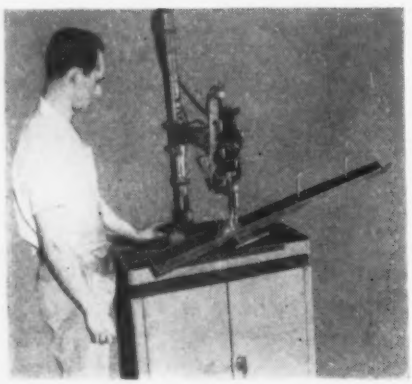
New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 103 or 104.



Vacuum coater designed for limited production

The Model 3111 coater has been designed for development work and limited commercial production in vacuum metallizing. It costs approximately one-third that of large production-scale equipment. Its high-speed pumping system features the NRC rotary gas ballast pump which can pump water vapor without loss of pumping speed or capacity and without contamination of oil. All necessary instrumentation, including the new Model 511 Alphatron vacuum gage, is an integral part of the coater. The vertical coating chamber is 24 in. diam x 30 in. high. One man can easily operate the coater. *National Research Corp.*

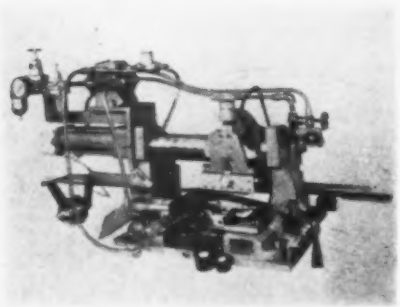
For more data circle No. 17 on postcard, p. 103.



Anchor studs installed in a split second

The Nelson stud welding gun can be used to install concrete anchors on steel curb angles and other structural members which are to be anchored in concrete or masonry. A special fluxed anchor stud of high quality cold-drawn steel with tensile strength of 75,000 to 85,000 psi has been offered for this purpose. These ½-in. diam anchor studs can be installed in a split-second with the semi-automatic stud welding gun which operates with equal effectiveness in the angle or on the faces of trench frames, column guards, joists and any other shape. Accurate positioning is maintained by fixtures developed for the purpose and distortion is eliminated. *Nelson Stud Welding Div., Gregory Industries, Inc.*

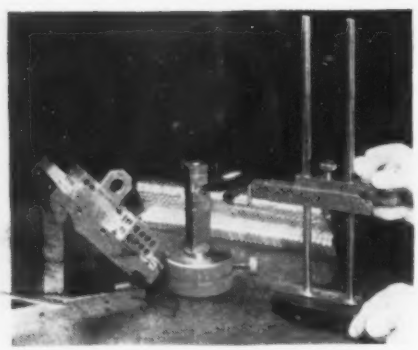
For more data circle No. 18 on postcard, p. 103.



Air assembly feeds, ejects and marks parts

New air operated assembly combines the feeding of parts, the actual marking of them and then the ejection-automatically. Operated from standard air lines used in most shops and requiring only 75 psi this arrangement provides automatic production marking on plastic, metal or parts of other materials. Feed control valve is actuated by each stroke of the marking machine. After each stroke another valve is opened providing air pressure to remove the marked part. For plastic parts a heating element warms the die to a controlled temperature. *Acromark Co.*

For more data circle No. 19 on postcard, p. 103.



Production parts can be checked with speed

Fast, accurate precision inspection and layout work are possible with a new indicator height gage and an adjustable inspection block. The indicator height gage, set to master parts or standard gage blocks, can be quickly adjusted to approximate height and positively locked in place. Final adjustments can be made in millionths of an inch with one hand. The adjustable inspection block reduces inspection time by eliminating time-consuming trial and error readings of the height gage. It is adjustable in millionths of an inch through a range of 0.250 in. vertically. *Tietzmann Tool Corp.*

For more data circle No. 20 on postcard, p. 103.

Turn Page

STEEL PROBLEMS ?

One call gives you ALL the answers!

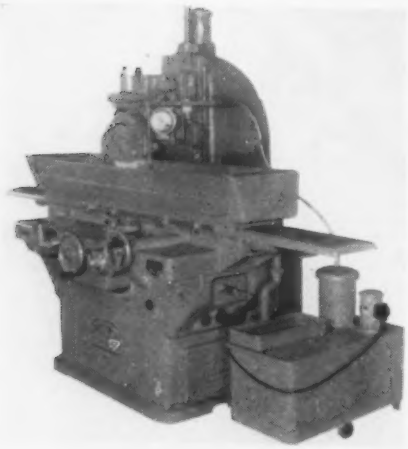
Delays are costly. When a business is faced with a problem, it is to its advantage to solve it quickly and maintain production rates. Of course—in this age of mass production, specialists, and far-flung operations—that isn't always possible. But Weirton, with a full appreciation of the importance of its customers' problems, has integrated all operations to provide time-saving answers.

At Weirton, key men who may be needed for decisions on prices, quantities, metallurgy, deliveries, or other problems are within quick reach of one another. Sales, laboratory, production, shipping—all departments are "under one roof" to cut delays to a minimum when customers need quick action.

This method of operation was established for your benefit. When you are faced with a steel problem, pick up your phone and get *all* the answers quickly . . . from Weirton.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



Surface grinder combines speed and quality

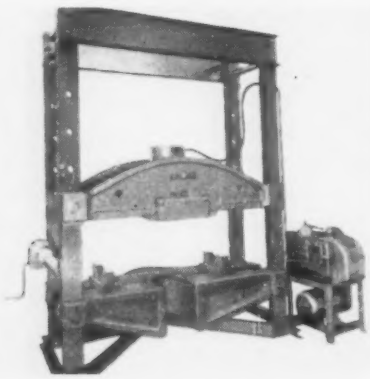
The Magerle tool and production surface grinding machines offer accuracy and quality of finish and will complete repeated loadings of the chuck automatically to within 0.0002 in. of required size. Automatic feature of head feed is controlled by an independent electrical circuit. Amount of feed is adjusted by a control screw which remains free for hand setting. The automatic feed operates on each longitudinal reversal of the table or, when required for automatic plunge grinding, on each second reversal of the table. It is pre-set to stop when the required work size is obtained; a pilot light signals completion. Machine requires no attendance during the grinding operation. Table motions are hydraulically powered, longitudinally variable from 10 to 100 fpm. Machines are built with 2, 3 and 4 ft table travel. *Pellow Machine Co.*

For more data circle No. 21 on postcard, p. 103.

Lathe operation put on productivity basis

Marvic consists of a four-faced block and five basic tool holders, and is used to solve problems involved in engine lathe operation. The tool block is mounted quickly and easily on any engine lathe. It is rock-solid permitting deep cuts, without chatter and without tool breakage, and full power operation of the lathe. The tool holders fit dovetail channels on the faces of the block; are positively locked in any one of the four faces, without changing the block position. The machinist can work closer to the chuck or tail stock. Boring, drilling, reaming and tapping are done with perfect alignment. The Marvic block comes in three sizes to accommodate lathe ranges from 10 to 26 in. *Marvic, Inc.*

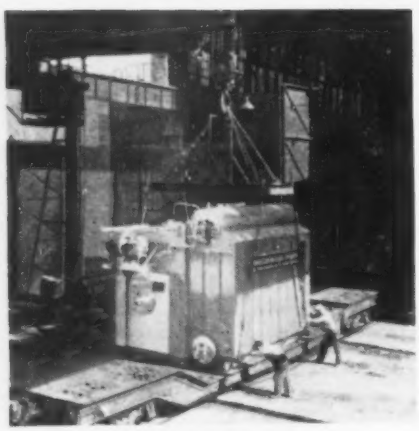
For more data circle No. 22 on postcard, p. 103.



Open yoke press performs work of 3 presses

The work of three separate presses can be performed on a new open yoke press. It incorporates the features of standard shop presses, can handle practically every job done on regular forcing presses and, because of a fully machined yoke bed can be used as a regular platen press. Open yoke presses are available in 100, 200, 300 and 400 ton capacities. A wear collar is supplied for inserting in yoke recess and a bed plate insert to cover recess provides a continuous flat working surface. A movable cylinder with locking device provides full pressure across the entire width of the press. Clear open ends permit entrance of long material. Hand winch raises or lowers bolster. *Rodgers Hydraulic, Inc.*

For more data circle No. 23 on postcard, p. 103.



Package boilers operate in medium pressure range

A new line of standardized, shop-assembled water-tube boilers is comprised of compact, reliable steam generating units designed to meet the demand for standardized boilers operating in the medium pressure range and for steam capacities ranging from 4000 to 30,000 lb per hr. The VP boiler is based on the two-drum, vertical-bent-tube arrangement with a water-cooled furnace in front of the convection surface. A high ratio of furnace-wall cooling to furnace volume assures rapid and efficient heat absorption and lower gas temperatures entering the convection bank. The boiler is designed for pressure firing of oil or gas either alone or in combination. *Combustion Engineering - Superheater, Inc.*

For more data circle No. 24 on postcard, p. 103.

Turn Page

Is long service life at low cost your problem?

here's how leading tractor manufacturers solve it with NEEDLE BEARINGS

Many makers of farm tractors specify Torrington Needle Bearings because of their relatively low cost and their long maintenance-free operation under rugged conditions.

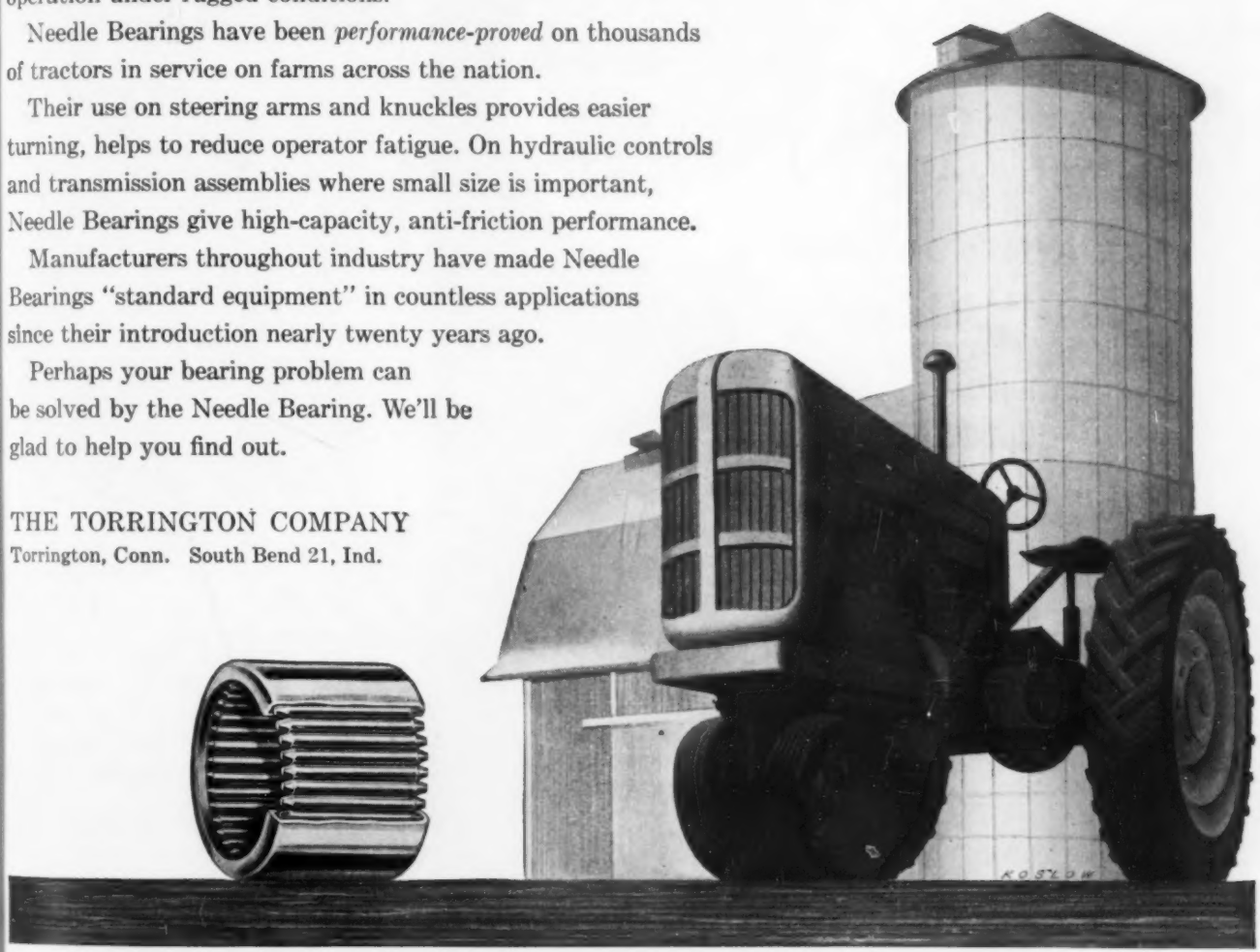
Needle Bearings have been *performance-proved* on thousands of tractors in service on farms across the nation.

Their use on steering arms and knuckles provides easier turning, helps to reduce operator fatigue. On hydraulic controls and transmission assemblies where small size is important, Needle Bearings give high-capacity, anti-friction performance.

Manufacturers throughout industry have made Needle Bearings "standard equipment" in countless applications since their introduction nearly twenty years ago.

Perhaps your bearing problem can be solved by the Needle Bearing. We'll be glad to help you find out.

THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.



TORRINGTON *NEEDLE* **BEARINGS**

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers

Trade-marks of some of the manufacturers who use Needle Bearings

A-C ALLIS-CHALMERS · JOHN DEERE QUALITY FARM EQUIPMENT · MASSEY-HARRIS M-H · OLIVER · CATERPILLAR · Ferguson · INTERNATIONAL HARVESTER · Ford · MM MINNEAPOLIS-MOLINE MODERN MACHINERY · GAS

LOW COST
IRIDITE®
FINISHES

for zinc, cadmium, aluminum and cuprous metals

provide corrosion resistance
paint base
choice of appearance

And they are easy to apply! Just a simple chemical dip for only a few seconds produces the coating.

LOW MATERIAL AND SHIPPING COSTS

combine to make Iridite the most economical chromate finish you can buy. Many Iridite chemicals are packed in powder form, thus can be shipped to you in steel pails at freight savings of up to 75%! Pails take less storage space, are easier to handle, eliminate carboys, need not be returned.

WHY NOT TEST IRIDITE ON YOUR PRODUCTS? Write for literature and send samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

Iridite is approved under government specifications.

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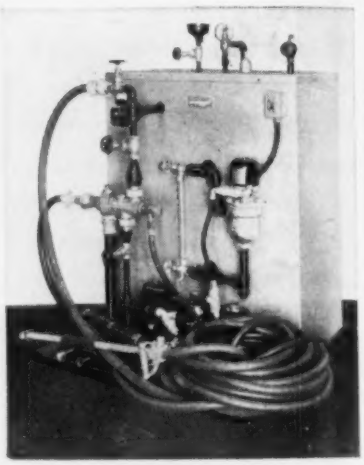
Manufacturers of Iridite Finishes
for Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Brighteners.
West Coast Licensee: L. M. HUTCHER COMPANY

Fast plant clean-up

New labor saving unit combines the Speedylectric steam-jet and the Sellers injector hydraulic jet to provide a solid jet of superheated water and detergent, propelled under extremely high discharge pressure and temperature. Cannon like force, manually controlled, removes grease deposits and soil encrustations which defy other cleaning methods. It reaches inaccessible machinery parts, eliminating down-



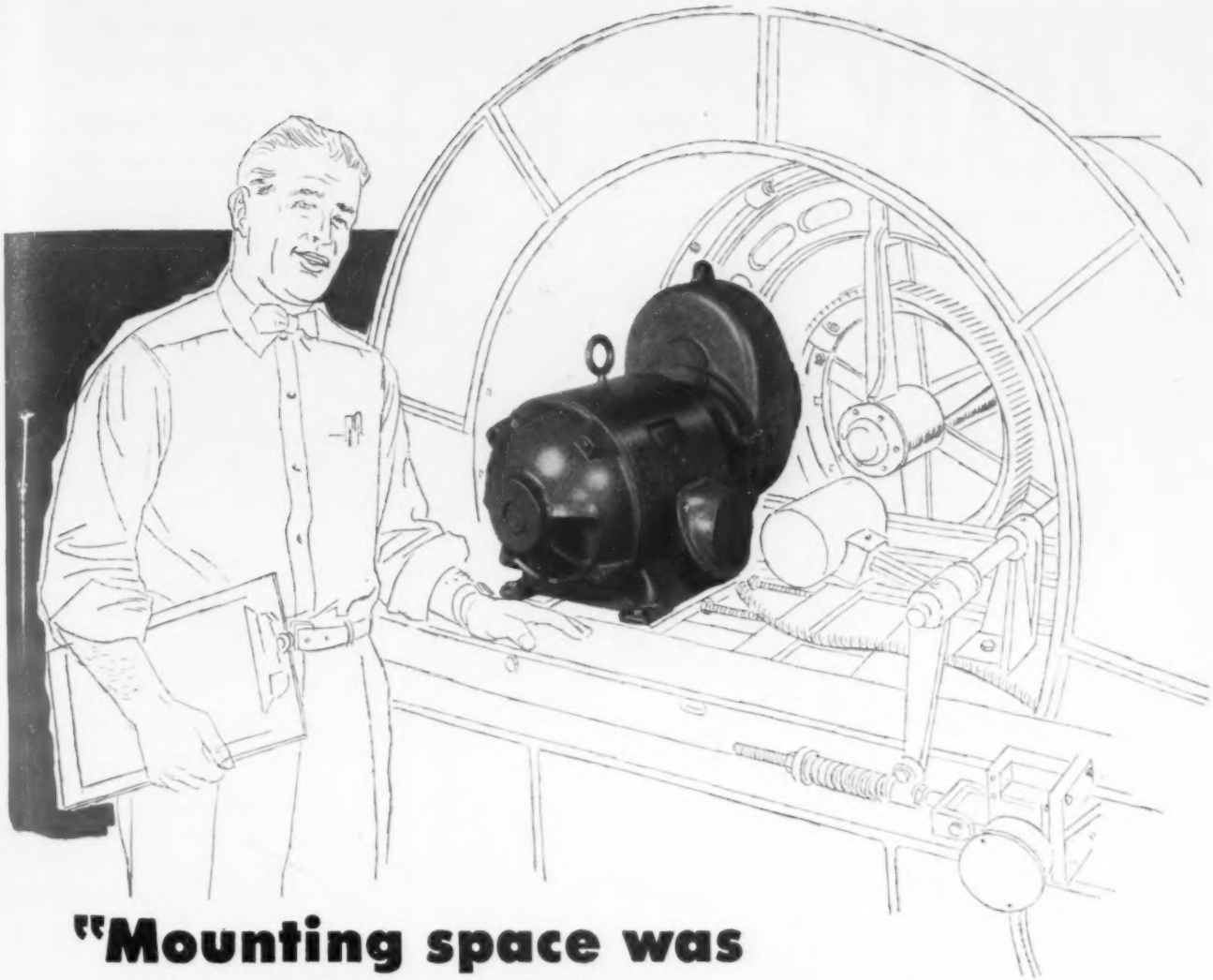
time and wasted manhours. For delicate parts of machines, the steam-jet provides pin point cleaning under fingertip control of operator. Sparks, flames and fire hazards are completely eliminated. Operation is from 220, 440 or 550 v, 3 or 2 phase, 60 or 25 cycle power supply. *Livingstone Engineering Co.*

For more data circle No. 25 on postcard, p. 103.

Portable grinders

Two new general purpose grinders are adaptable to die grinding and use with rotary files, cutters and midget mills. Available with lock button or lever throttle, these spindle grinders take a 2-in. organic wheel and are offered with extension adapters for using mounted wheels. These air tools are compact, weigh 1¾ lb. They feature one-piece shaft design, eliminating replacement of expensive parts when wear occurs. *Buckeye Tools Corp.*

For more data circle No. 26 on postcard, p. 103.
Turn Page



"Mounting space was a big problem with us— now we use *Life-Line* GEARMOTORS"

"There isn't much space left for mounting a geared drive by the time we squeeze in all the other components of this machine. We find that an integral-type gearmotor is a must and that a Life-Line Gearmotor, in particular, offers the best solution.

"These Life-Line Gearmotors take up less space than any other form of drive we have tried, such as: chains, belts, open gears or coupled speed reducers.

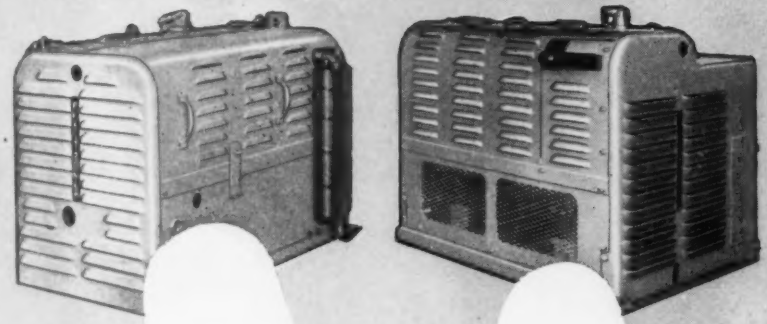
"Whenever we have a speed reduction drive problem we call in the local Westinghouse representative for consultation. I'm sure you'll find his assistance valuable also."

For complete descriptive literature on Life-Line Gearmotors, write to: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-07314

YOU CAN BE SURE...IF IT'S
Westinghouse
Life-Line
GEARMOTORS

READY-POWER

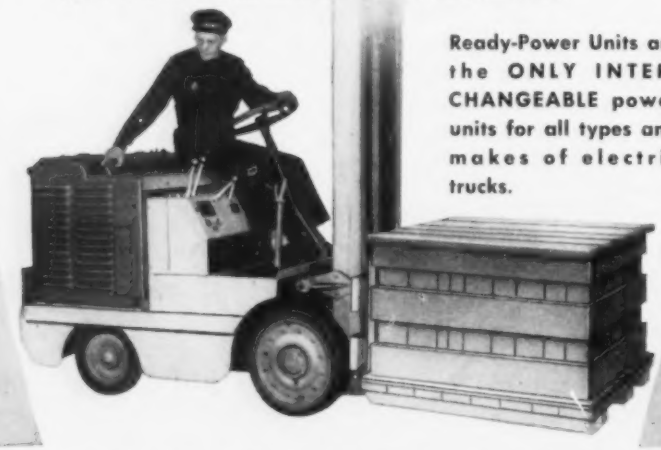
GAS-ELECTRIC **DIESEL-ELECTRIC**



Now... 2 Types of Continuous-Duty Power Units

FOR ALL ELECTRIC TRUCKS

Now you can select either gas-electric or Diesel-electric Ready-Power for any size or make of electric truck. GAS-ELECTRIC Models are for the tough materials handling jobs . . . DIESEL-ELECTRIC Models master the "impossible" jobs that keep trucks going day and nite, year after year. Ready-Power continuous-duty drive operates electric trucks at the lowest known costs per ton mile! Write us for additional information.



Ready-Power Units are the ONLY INTERCHANGEABLE power units for all types and makes of electric trucks.

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

Endless round belts

By using a simple device for joining the ends of round leather belting, the ends of the belt can be tapered and cemented together in less than 2 min. The cement will set sufficiently for use in 2 hr or

less. The upper illustration shows how a 2-in. taper is made by turning the belt with a razor blade. The lower one shows the belt ready for cementing. At present the belt splicer is made only for 3/16 in. round belting. On machines which cannot be taken apart to insert a standard endless belt it will be found most useful. *Louis Levin & Son, Inc.*

For more data circle No. 27 on postcard, p. 103.

Pneumatic lubricator

Automatically lubricating pneumatic tools with oiled air and at the same time filtering the line are possible with a new oiler, trade-named Air-Speed Williams pneumatic lubricator. It features light weight

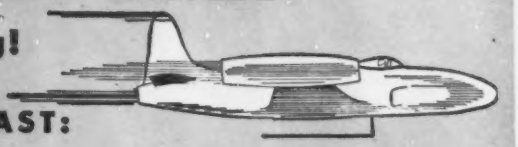
Neoprene shock-absorber O ring mountings to permit dragging with the hose without damage. A nonbreakable, clear-vision window shows oil supply. Any good oil up to SAE 30 may be used. Needle-point adjustment controls oil flow. *Air Speed Tool Co.*

For more data circle No. 28 on postcard, p. 103.

Turn Page

today, you're hardly aware of any **SPEED LIMIT** *

on surface broaching!



BUT HERE'S WHAT IT'S BEEN IN THE PAST:

6 fpm 1902

25 fpm 1922

60 fpm 1942

today 300 fpm . . . and more!

*Of course we're talking about the new LAPOINTE ELECTRO-MECHANICAL DRIVE horizontal BROACHING MACHINE

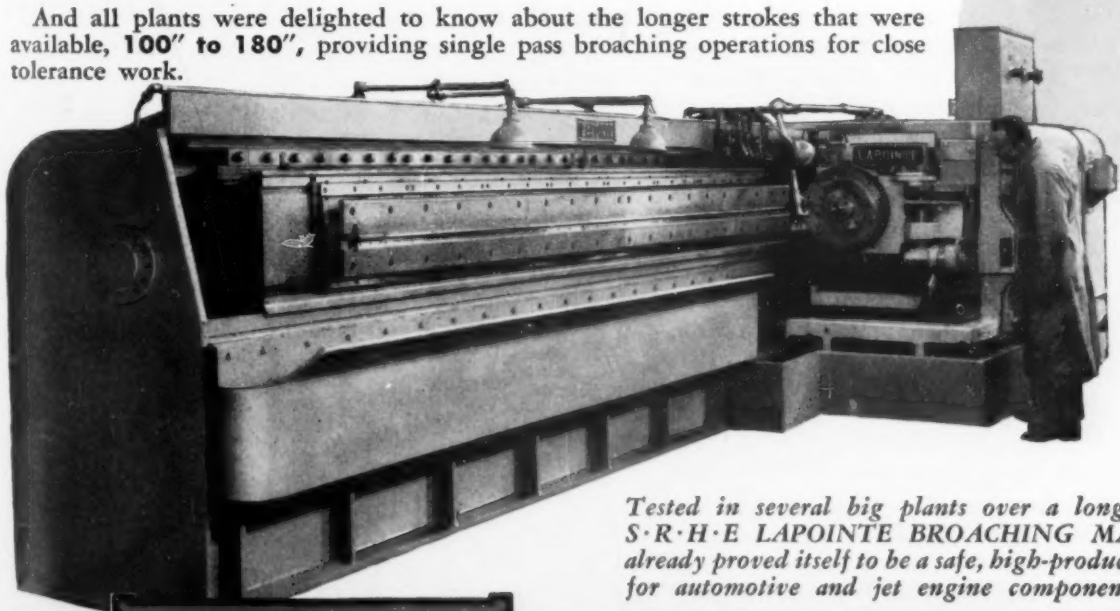
Enthusiastic approval of this new LAPOINTE BROACHING machine has been given by some of the best people — and best plants — in America! How? *They said it with orders!*

These orders came, because some plants wanted the greater flexibility and versatility now available through the Dual Speed and Dual Cycle (patented) features;

Some plants needed the higher production now possible in a modern high-speed broaching machine;

And all plants were delighted to know about the longer strokes that were available, **100" to 180"**, providing single pass broaching operations for close tolerance work.

Write for new Technical Bulletin **SRHE-9**



Tested in several big plants over a long period, the S·R·H·E LAPOINTE BROACHING MACHINE has already proved itself to be a safe, high-production machine for automotive and jet engine components especially.

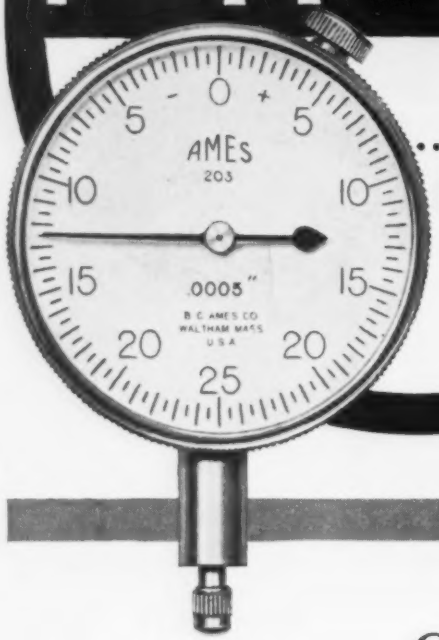
THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

In England: Watford, Hertfordshire

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

AMES



...the preferred Dial Indicators

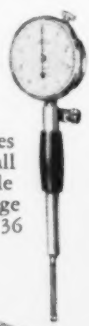
One of America's largest and most famous mass-producers recently chose Ames as preferred source of supply for indicator gauges.

The reasons behind this decision are the very reasons why *you* should standardize on Ames dial indicators and dial gauges:—the Ames "Hundred Series" indicators available in four sizes, fit every measuring requirement; they are *accurate, sensitive,* low in friction, yet are *rugged* and *tough*—give *more* on-the-job time. All Ames products embody latest design and highest-quality materials; they are manufactured by methods and machines that are *exclusive* with B. C. Ames Co.

Ames Dial Depth Gauge No. 11C

Ames Dial Micrometer No. 517

Ames Amplifying Dial Comparator No. 26



Ames Small Hole Gauge No. 36

Send today for your free copy of Catalog No. 58

Representatives in principal cities. B. C. AMES CO. *25 Ames Street Waltham 54, Mass.*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

Straightening press

Any shop can do its own straightening of long shafts, bars, workpieces or machinery parts using the new Lempco straightening press. The press features a frame that looks much like a sawhorse, with underslung hydraulic pump and cylinder, fastened to the shaft by

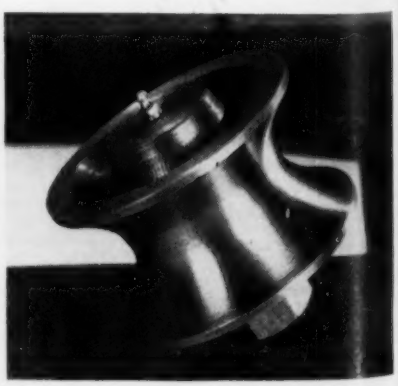
means of an open-throat clamp. Pressure on the shaft is exerted at one or more points along its length until the dial indicator mounted on the frame shows identical reading at each point. Small work measuring 1 ft or more up to large 7 to 10-ft shafts can be straightened on the press. *Lempco Products, Inc.*

For more data circle No. 29 on postcard, p. 103.

Conveyor belt guide

Conveyor belt edges will not rip, fray or tear if held on course by this simple adaption of the hyperbolic principle. Named a Guidler because it serves as an idler as well as a guide, the new device presents a long, smooth yielding surface to the belt edge instead of a single striking point. *Knapp Mills, Inc.*

For more data circle No. 30 on postcard, p. 103.



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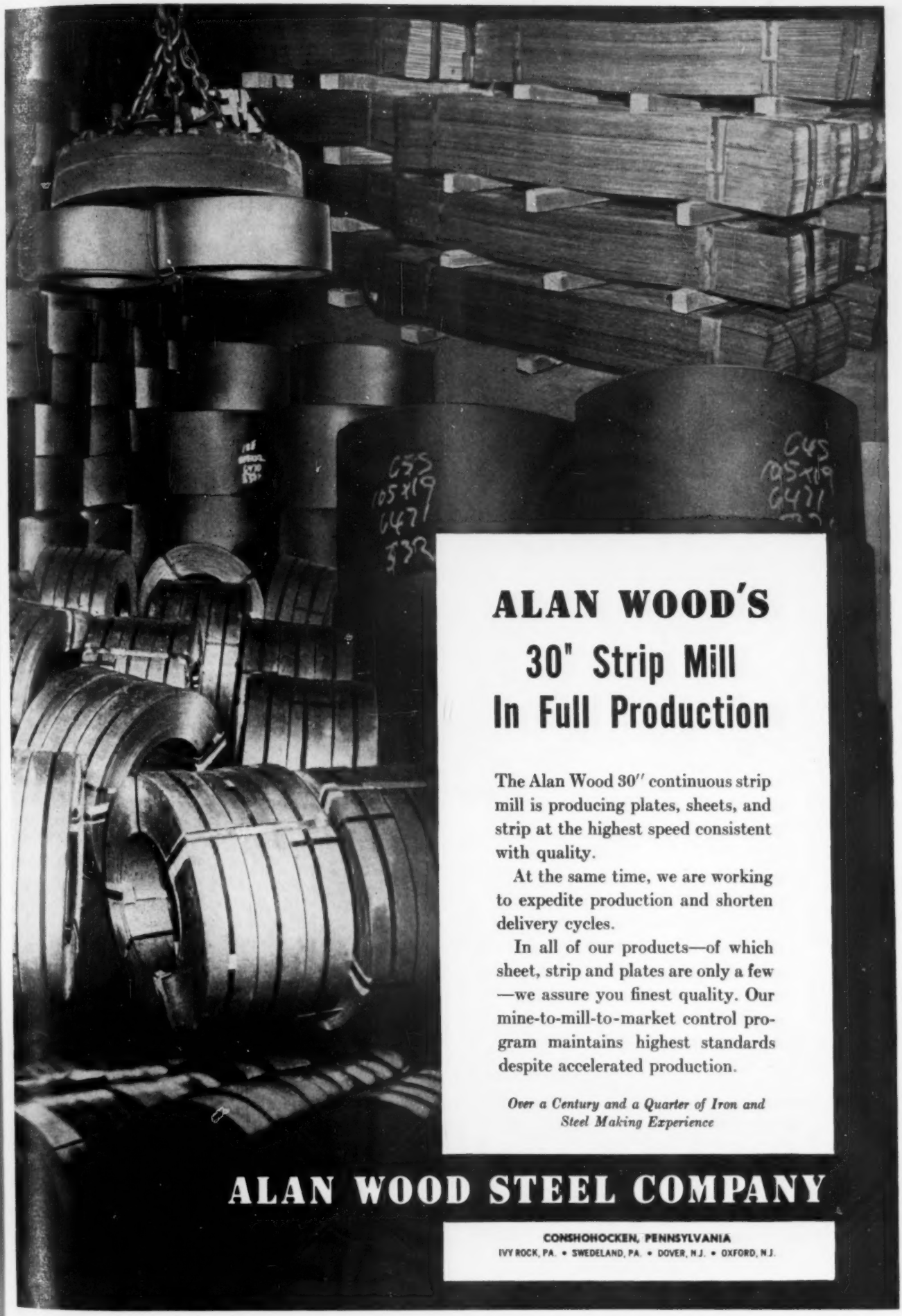


ALAN WOOD'S
30" Strip Mill
In Full Production

The Alan Wood 30" continuous strip mill is producing plates, sheets, and strip at the highest speed consistent with quality.

At the same time, we are working to expedite production and shorten delivery cycles.

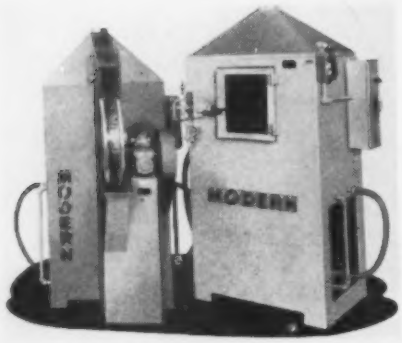
In all of our products—of which sheet, strip and plates are only a few —we assure you finest quality. Our mine-to-mill-to-market control program maintains highest standards despite accelerated production.

Over a Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PENNSYLVANIA

IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N.J. • OXFORD, N.J.

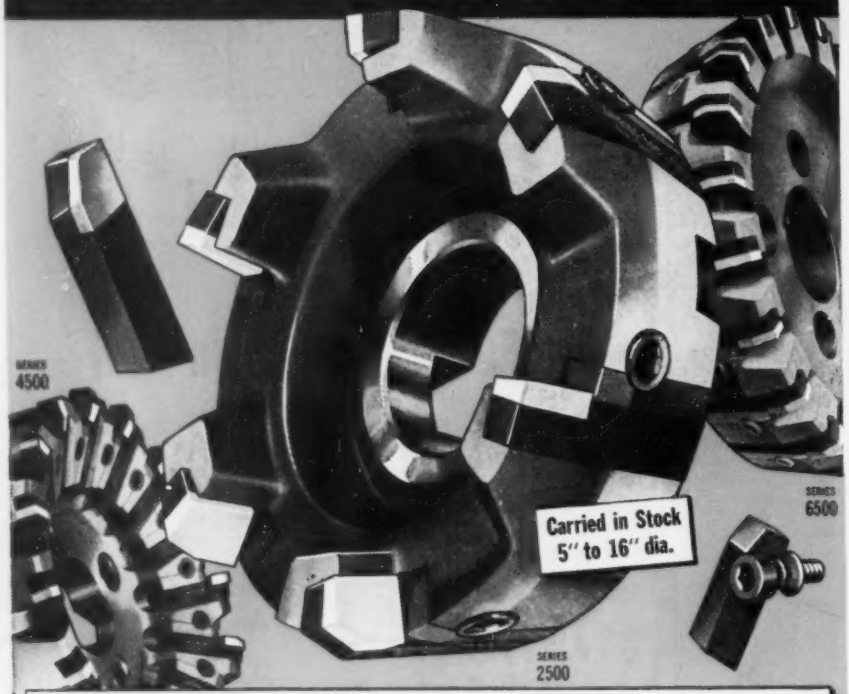


Soft metal parts deburred rapidly

Fast production deburring of soft metal parts, using either a continuous rotating process for small parts or a stationary clamping arrangement for larger units, is possible with two standard Maizo blast machines. Both types remove light burrs from metals in the range of aluminum to mild steel. Maize or a similar soft material is blasted against the parts under factory airline pressure. The ferris-wheel model yields a production rate of 192 to 288 pieces per hr at 100 pct efficiency. Speed of rotation can be varied. Larger work is handled in Model MA-1 with work rotating on a fixed axis in a fixture. *Modern Industrial Engineering Co.*

For more data circle No. 31 on postcard, p. 103.

The Gairing
STANDARD MILLING CUTTERS
E-CON-O-MILL



YOU'LL SAVE

ON INVENTORY • *Same size blades, for cutting steel, cast iron or nonferrous, fit cutter bodies of all sizes in all series.*

ON GRINDING • *Blades are supplied sharpened, ready for use, may be re-sharpened in or out of the body, to a gage.*

WAITING for DELIVERY • *All series 2500 cutters 5" to 16" dia. and all blades carried in stock for immediate delivery.*

TOOLING by GAIRING

Whether you buy one or several sizes, you always save with E-Con-O-Mill. Proved savings in the cost of diamond wheels alone have caused many shops, both large and small, to standardize on E-Con-O-Mill • But, foremost, they're efficient cutters of truly one-piece rigidity • Get the whole story on this great development in standard tooling by writing for our E-Con-O-Mill catalog.

In Canada: A. C. Wickman (Canada) Ltd., Queensway, Toronto 14

The GAIRING TOOL COMPANY • 21224 Hoover Road • Detroit 32, Michigan

Fire blanket

A glass cloth fire blanket coated with vinyl plastic provides protection against fire tragedy for both human life and small industrial equipment. The blanket when thrown over a person or machine enveloped in flames, effectively cuts off the oxygen and quickly smothers the fire. Stasafe all weather fire blanket needs no covering to protect it from the elements. It weighs 2½ lb, measures 76 x 60 in. "Fire Blanket" is printed on it in red for easy identification. *B. F. Goodrich Chemical Co.*

For more data circle No. 32 on postcard, p. 103.

Load grab

A basic load grab attachment has been converted into a side shifting grab; can be aligned with the load instead of maneuvering the truck in crowded quarters. Side shifting can be accomplished with or without load. On pallet type forks it aligns the forks under the load in the same manner. *Hyster Co.*

For more data circle No. 33 on postcard, p. 103.

Truck weighing unit

Combination swivel arm and scale for electric or hydraulic lift trucks weighs merchandise while it is being transferred, stacked or inventoried. It is a steel arm that has been welded to the mechanism at the front of the truck. The arm revolves in a wide arc and can be locked as desired. A hook on the

end of it engages the weight indicator. This arrangement provides a highly mobile weighing setup. The weight indicator can be removed when desired. Scale has 16-in. diam dial with ball bearing swivel hook and rapid adjustment for tare loads. Numerous capacities are available. *W. C. Dillon & Co., Inc.*

For more data circle No. 34 on postcard, p. 103.

Source container

New three curie high intensity shielding container for shipping and storage of Cobalt-60 radiography or other sources, is constructed of 4¾ in. of lead plus ⅜ in. of malleable iron. It provides shielding that is equivalent of 5 in. of lead. A removable lead insert with a tapered hole accepts the radiography sources; may be adapted to accept other sources. *Tracerlab, Inc.*

For more data circle No. 35 on postcard, p. 103.

Pole trailer

Double tube pole trailer will carry pipe, bars, piling and other long products up to 72 ft long. When closed, between axles and tow pins, it measures 24 ft. Capacity is up to 35,000 lb. Weight is 3 tons. *A. Jay Hofmann Co.*

For more data circle No. 36 on postcard, p. 103.

Turn Page

CERTIFIED ABRASIVES

CLEAN and CLEAN and CLEAN and CLEAN!

"Certified" Samson Shot and Angular Grit wear longer, clean better! That's because they're made *extra-tough* by a special *automatically controlled* hardening process that assures you fast, efficient, high-quality blast cleaning over and over again. Try "Certified" in *your* cleaning room and you will discover why it is the *first choice* in hundreds of foundries.

All sizes graded to SAE specifications.

Experienced Foundrymen say:

"Always specify Certified"

ACCEPTED AND USED FOR OVER 55 YEARS

PITTSBURGH CRUSHED STEEL CO.
Pittsburgh, Pa.

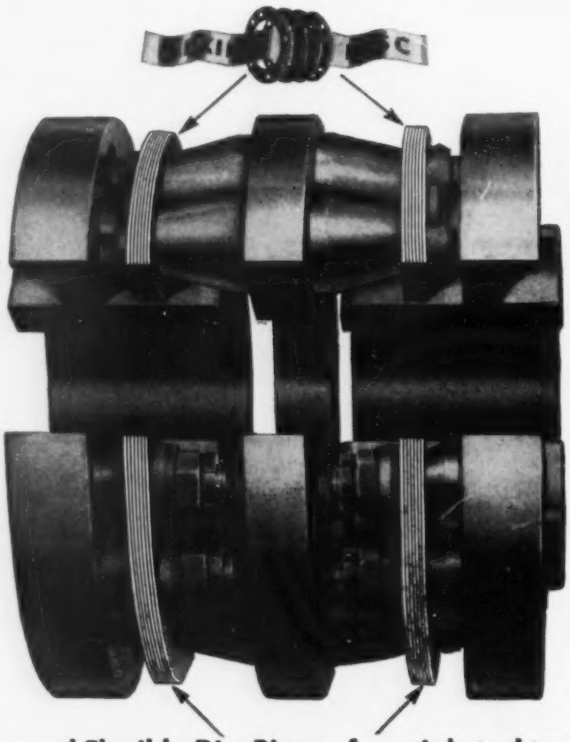
FEMA

STEEL SHOT AND GRIT CO.
Boston, Mass.

AVOID COSTLY SHUT-DOWNS!

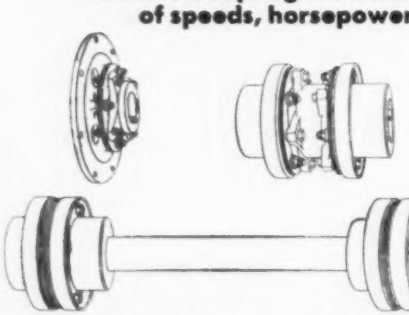
Specify THOMAS Flexible Couplings for Power Transmission

DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF FLEXIBLE COUPLINGS ONLY FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

—New Equipment—

Continued

Steel strapping kit

A completely self-contained steel strapping kit can be carried from job to job in plants, shops, storage yards, etc. Called the Utilikit, it contains a 300-ft coil of steel strapping in a cardboard dispenser, 1000 strapping seals and three basic tools: stretcher, sealer and snips. The kit is ideal for the small-volume user of steel strapping. *Brainard Steel Div., Sharon Steel Corp.*

For more data circle No. 37 on postcard, p. 103.

Back-up rings

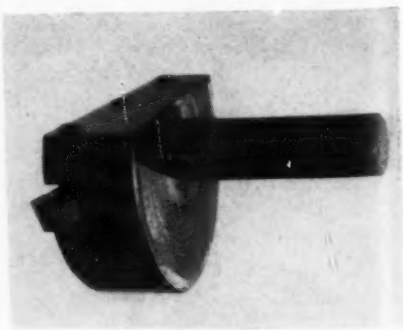
Back-up rings, spirally machined of Teflon have been designed to prevent extrusion of O rings. The Teflon rings have a high impact strength at temperatures from −100°F to +500°F; are non-corrosive, non-adhering, non-fraying, inert to most chemicals and self-lubricating. They are made for all O ring sizes to AN drawings 6227 and 6230. *Garlock Packing Co.*

For more data circle No. 38 on postcard, p. 103.

Small fly-cutter

A small fly-cutter from Germany is suitable to be used with a 3/16, ¼ or 5/16 in. tool bit. The tool is made from one piece for greater strength, has ½ in. shank. *Paul D. Rand Co.*

For more data circle No. 39 on postcard, p. 103.



The Iron Age

SALUTES

John C. Garrett

An air-minded executive, he has a practical knowledge of mechanics and a strong flair for sales.

CLIFF GARRETT has parlayed a mechanic's knack and hard-hitting sales ability into the nation's third largest aircraft accessory supply firm.

At 45 Cliff is president of Garrett Corp., Los Angeles, a dynamic organization which has grown with the aircraft industry.

The Garrett success story began in 1928 when he left college to work for the original Lockheed Aircraft Corp. as a 50¢-per-hr stockroom clerk. Later that year a fellow worker, the aircraft industry's Jack Northrop, started his own company and hired Cliff to assist him.

After a siege of illness, Garrett rejoined Northrop as procurement chief in 1932 when the latter headed the Northrop Corp., a Douglas Aircraft subsidiary in El Segundo, Calif.

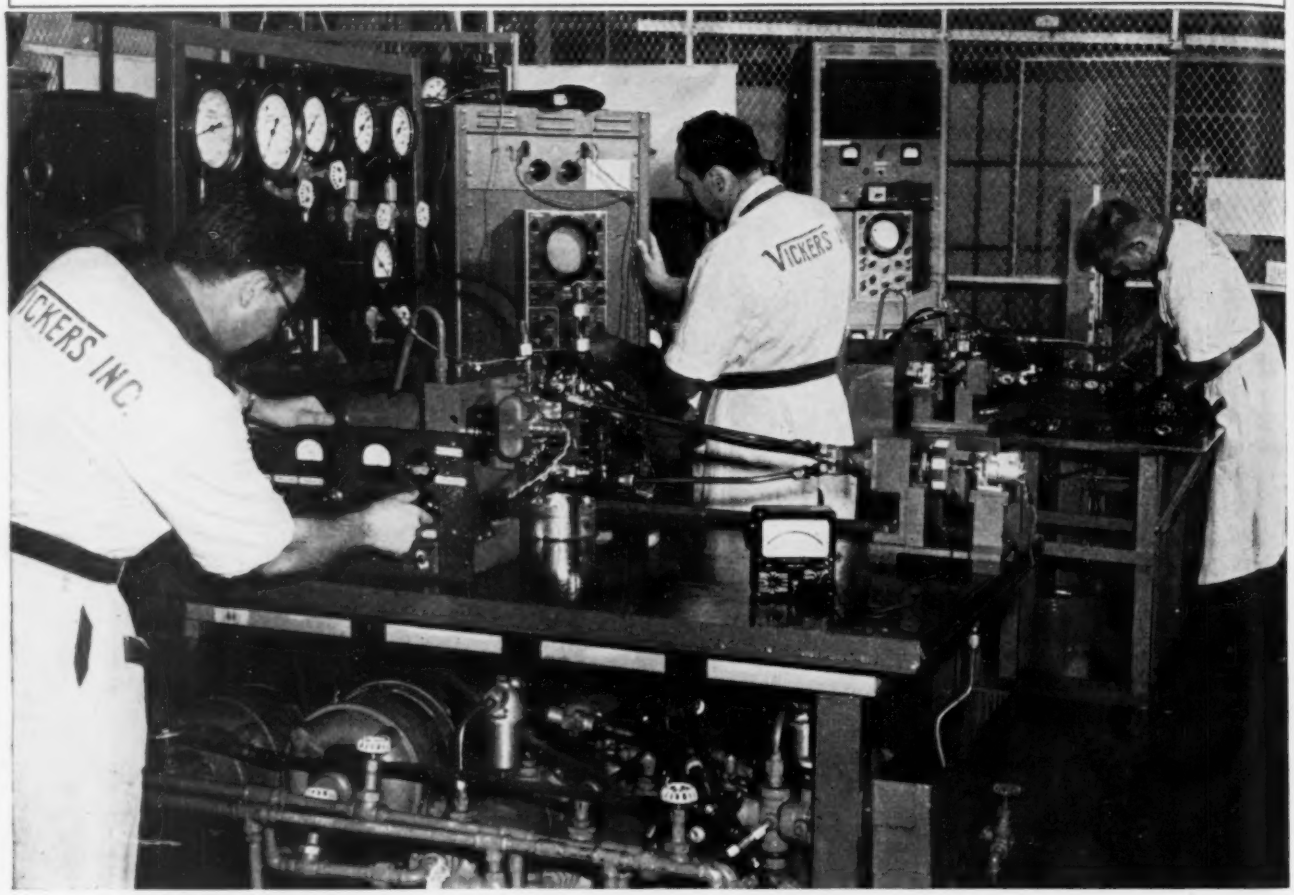
In 1936, realizing eastern tool manufacturers were finding it difficult to supply highly specialized tools for western aircraft firms, Cliff founded the Garrett Supply Co., which represented eastern manufacturers supplying specialty tools. When business mushroomed he divided the firm into the Airsupply Co. and Garrett Supply Co., the first for industrial supplies, the second for specialized engineering sales.

Three years later he entered the field of cabin pressure regulators, oil temperature control systems for high altitude flying and other specialties with the AiResearch Mfg. Co. Today the whole corporation consists of five divisions and a subsidiary including AiResearch Mfg. Co. of Phoenix.

Cliff is married and has an 8-year-old daughter. He flies his own DC-3 while commuting between his Phoenix and Los Angeles' plants.

ONE OF A SERIES

You Get Many Benefits by Specifying VICKERS Hydraulics



Research | that means improved oil hydraulic equipment

The list of pioneering developments in hydraulics contributed by Vickers research is long and impressive. Among the most important are:

Hydrostatic Relief Valve • Commercial Power Steering • Balanced Vane Type Pump • Flow Control Compensator • Axial Piston Pump and Motor

These are fundamental developments that have been of vital importance in the progress of hydraulics. They are representative of a large line of equipment that, with Vickers experienced application, assures you the best in any type of hydraulic operation. Vickers, with unmatched laboratory and basic research facilities, continues to lead the way in the oil hydraulics industry.

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6357

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

The Iron Age

INTRODUCES

Harry T. Marks, appointed administrative vice-president, FERRO CORP., Cleveland.

E. Bellande, becomes vice-president and assistant to the president, AIRESEARCH AVIATION SERVICE CO., a division of The Garrett Corp.

A. E. Williams, elected vice-president in charge of engineering, FRUEHAUF TRAILER CO.

Russell P. Folland, named vice-president and general manager, MONARCH PRODUCTS CO., Hazel Park, Mich.

Neil F. Meredith, appointed technical assistant to vice-president in charge of operations and engineering, BASIC REFRACTORIES INC., Cleveland.

T. M. Stonerod, appointed assistant to the vice-president and head of the Coal Mine Div., THE BROOKS OIL CO., Pittsburgh.

William H. Depperman, becomes director, Public Relations Dept., OLIN INDUSTRIES, INC., East Alton, Ill.

Phillip R. Heim, elected to the board of directors, and appointed vice-president in charge of manufacturing, VARD INC., Pasadena, Calif.

Wilbur T. Blair, appointed vice-president and treasurer, SHARON STEEL CORP., Sharon, Pa.

S. R. Zimmerman, Jr., elected a director of RAYBESTOS-MANHATTAN, INC., Passaic, N. J.

W. T. Blackburn, elected vice-president, CONTINENTAL BOX CO., Des Plaines, Ill.

Edward LeMaire, appointed sales engineer, Drill Steel Div., CRUCIBLE STEEL CO. OF AMERICA.

Julio Venturini, appointed combustion engineer, Los Angeles plant, BETHLEHEM PACIFIC COAST STEEL CORP.

J. M. Van Winckle, appointed chief engineer, QUEBEC IRON & TITANIUM CORP., Montreal.

K. A. Allen, appointed director of national accounts, Quaker Rubber Corp., Division of H. K. PORTER CO., INC., Philadelphia.

Harwood L. Brown, appointed factory sales engineer, Ohio territory, ELECTRO ARC SALES CO.

Thomas P. Quinn, appointed manager, Gulf-Southwest district GUNNISON HOMES, INC., U. S. Steel's housing subsidiary.

Raymond J. Odiorne, has been named manager, Lemoyne, Pa. plant, AMERICAN CAN CO.

John W. Little, placed in charge of all construction work, FISCHER & ASSOCIATES.

D. E. Inman, appointed engineering manager of general industrial products, WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Ted Evans, becomes mining superintendent, Sunbright, Va., FOOTE MINERAL CO.

R. H. Fellows, appointed manager of Sales and Engineering, Kilbourne & Jacobs Div., THE WOOD SHOVEL & TOOL CO., Piqua, Ohio.

Ben A. Schwirtz, appointed manager, Cleveland Sales Office, THE TRANE CO.

Hugh D. Luke, becomes department manager, Manufacturing Dept., RELIANCE ELECTRIC & ENGINEERING CO., Cleveland; **James A. Brandt,** named assistant manager of the department; and **A. S. Tusin,** promoted to superintendent.

KENNETH C. SPOONER, named vice-president, Simmons Machine Tool Corp. of Albany.

DOUGLAS B. MARTIN, elected vice-president in charge of sales, Amplex Div., Chrysler Corp., Detroit.

EDWARD A. ULVESTAD, named director of purchases, Kropp Forge Co., Chicago.

S. A. Crabtree and **R. W. Helms**, appointed assistant general managers of sales, REPUBLIC STEEL CORP., Cleveland.

H. Wilson Ryno, appointed sales representative, New Jersey and New York districts, COLUMBIA TOOL STEEL CO., Chicago Heights, Ill.

W. E. Bikle, appointed general manager, STANDARD RAILWAY EQUIPT. MFG. CO.

Oscar L. Dunn, appointed general manager, Direct-Current Motor & Generator Dept., GENERAL ELECTRIC CO., Erie, Pa.

P. J. Coyne, appointed plant manager, Houston plant, CONTINENTAL CAN CO.

M. L. Hiller, appointed district manager, ELLIOTT CO., Jeannette, Pa.

John T. Walmsley, promoted to salesman, Chicago and Midwest Area, HOOKER ELECTROCHEMICAL CO.

Edward H. Gunton, named assistant manager in charge of operations, SOLAR AIRCRAFT CO.; **William Dixon**, becomes production engineering division manager; and **Marvin L. Nelson**, appointed head of a newly organized quality control Div.

Joseph B. Talley, named works manager, Bacchus, Utah, plant of HERCULES POWDER CO., Wilmington, Del.

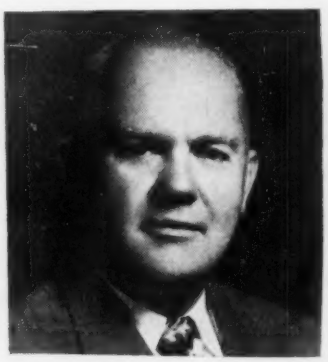
Robert L. Orth, appointed field sales manager, AMERICAN WHEELABRATOR & EQUIPMENT CORP., Mishawaka, Ind.; **Julius E. Skene**, advanced to manager of customer service; and **Philip R. Jordon**, promoted to chief sales engineer.

Aaron F. Bowser, appointed district sales manager, Buffalo, Rochester territory, SYLVANIA ELECTRIC CORP.

Archie C. Greer, appointed purchasing agent, Pittsburgh Steamship Div., U. S. STEEL CORP.

J. ROY GORDON, elected vice-president and general manager of Canadian Operations, The International Nickel Co., of Canada, Ltd.

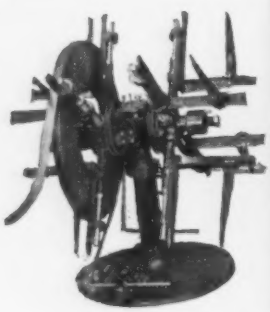
DEAN WEIKART, promoted to chief engineer, Tupelo, Miss., plant, Rockwell Mfg. Co.



JAMES P. WILLIAMS, appointed assistant general superintendent, Kaiser Steel Corp., Fontana, Plant.

JACK R. FRASER, appointed chief petroleum engineer, Texas Eastern Production Corp., of Houston, Texas.

LESS DOWN TIME, MORE PRODUCTION FROM PUNCH PRESSES FED BY



LITTELL DOUBLE AUTOMATIC CENTERING REELS

Vital minutes are saved, with practically no down time for coil replacement, when a Littell Double Reel uncoils stock to the punch press. The idle side of the reel is loaded while the other side pays out. When a coil is used up, the operator simply lifts the hub lock pin, then swivels the reel 180°, thus placing the reserve coil in press feeding position. The change-over is complete in a few seconds. Like Littell Single Reels, Littell Double Reels combine balance that means smooth running accuracy with rugged malleable iron and steel construction that assures year in, year out dependability.

FOUR SIZES
No. 3 . . . . . for coils up to 300 lbs.
No. 5* . . . . for coils up to 600 lbs.
No. 10* . . . for coils up to 1,000 lbs.
No. 25* . . . for coils up to 2,500 lbs.
*Can be furnished with motor drive

Write for catalog

F. J. LITTELL MACHINE CO.
Speed with Safety

ROLL FEEDS • DIAL FEEDS
STRAIGHTENING MACHINES
REELS • AIR BLAST VALVES
District Offices: Detroit, Cleveland

4141 N. RAVENSWOOD AVE., CHICAGO 13, ILL.

Among the many contractors who make these 50 caliber, 60 caliber and 20 m/m brass and steel cartridge cases, a few use machines that are strictly special—designs that will be practically scrap value, so far as adaptability to other work is concerned, when the shell job is finished.

Many more millions of these shell cases are now being machined on

Standard 6 Spindle ACME-GRIDLEY Bar Automatics

Some of these standard machines are equipped with magazines loaded by hand, as on the job illustrated, others with fully automatic hopper feeds—reducing man hours to minimum.

And with simple carbide tools output is fast—in fact 1.5 seconds (2,400 per hour).

* * *

WHAT'S THE PAYOFF? Just this—when the job is done, Acme-Gridleys can quickly be retooled—good for years more service on peace-time parts production. Quite a difference in investment value and long terms profit.

Whatever your specific bar automatic needs today, consider also the value of these machines tomorrow—the importance of Acme-Gridley basic universal application and modern tooling ingenuity.

We've built more than 45,000 of them—in sizes up to 7¾" capacity.

You can't do TODAY'S *job... with* YESTERDAY'S *tools... and be in business* TOMORROW

The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle —Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.

INFORMATION

at your JOB-SIDE for . . .

SPECIFIC-PURPOSE Grinding Wheels, Vitrified and Resinoid . . . Standard and High Speeds

Is it reasonable to presume that YOUR grinding and cutting-off wheel problems will best be solved by a combination of what you know PLUS what our technical experts can learn *at your job-side?*

Worthwhile suggestions concerning grinding and cutting-off operations, of definite value to our active and prospective customers have often resulted from such a combination.

You are invited to let us try this combination at your job-side; no cost, no obligation, no sales pressure. For this service, simply write, wire or phone us, and a technical expert will come to your plant. Electro Refractories & Abrasives Corporation, 344 Delaware Ave., BUFFALO 2, N. Y.

Electro SINCE 1919

Manufacturing Plants: Buffalo, N. Y. and Cap-de-la-Madeleine, P. Q., Canada. Regional Warehouse: Los Angeles 58, Calif. • Grant S. Diamond, President

K-436

Specific-Purpose GRINDING WHEELS

—Personnel—

Continued

Byron Coon, becomes regional manager, Western Div.; ROCKWELL MFG. CO.: Delta Power Tool Div.; **George H. Madeska,** named regional manager, Central Div.; **Walter H. Redpath,** named regional manager, Canadian Div.; and **George E. Rockwell,** named regional manager, Eastern Div.

Faison S. Kuester, appointed district representative, REPUBLIC STEEL KITCHENS.

Charles E. Brady, appointed to sales staff, N. T. GATES CO., Philadelphia.

L. N. Dukelow, appointed special representative, Alloy Products, General Sales Dept., JONES & LAUGHLIN STEEL CORP., Pittsburgh.

E. A. Warnecke, becomes sales representative, Milwaukee and the State of Wisconsin, THE DIVERSEY CORP., Metal Industries Dept.; **J. B. Rogers,** named sales representative, Cleveland area; and **W. E. Gilroy,** named sales representative, Connecticut.

James E. Young and **John A. Evans,** promoted to purchasing agents, SERVEL, INC., Evansville, Ind.; **William K. Johnson,** named subcontracts manager; and **Frank A. Kalkbrenner,** appointed supervisor of purchasing services.

James A. Moody, named district sales representative, Philadelphia, C. A. NORGREN CO.

William R. Patton, named purchasing agent, NEW HOLLAND MACHINE CO., New Holland, Pa., a subsidiary of the Sperry Corp.

Elmer W. Rasmussen, appointed representative in Florida, FEEDRAIL CORP.

OBITUARIES

Sumner Simpson, 79, board chairman, Raybestos-Manhattan, Inc., recently in Bridgeport, Conn.

John E. Powell, application engineer, Worthington Corp., Harrison, N. J., recently at Wellsville, N. Y.

James A. Struthers, 60, works manager, Hercules Powder Co., Bacchus, Utah, suddenly of a heart attack while on the job recently.

Hold that tolerance—

COOL THE COOLANT For Precise Machining

◆ In machining the major parts of R-1820 Wright radial engines, maintenance of coolant at gaging temperatures is of prime importance . . . These magnesium workpieces are extremely sensitive to heat generated by cutting action and temperature variations.

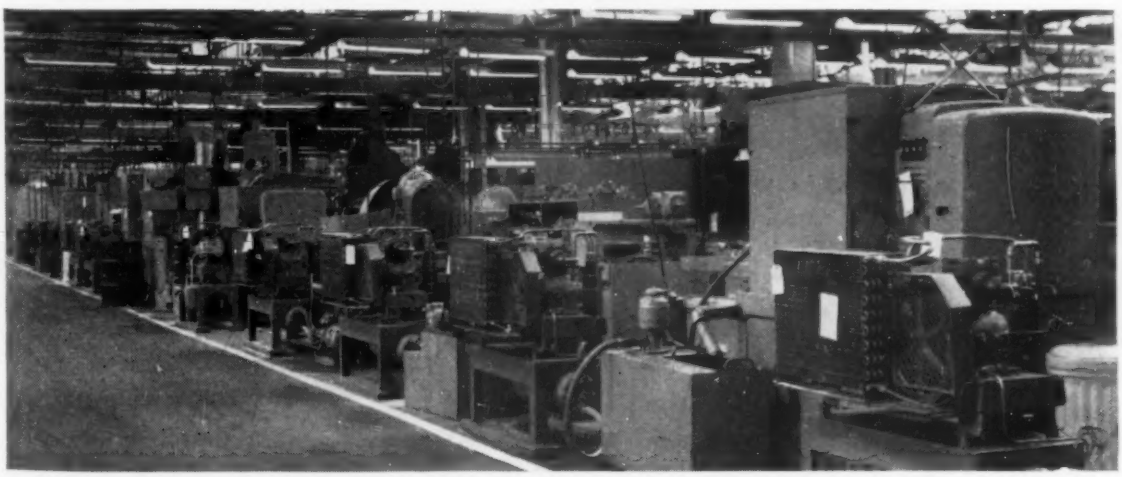
◆ To overcome this Bridgeport-Lycoming Div., Avco Mfg. Co. has installed coolant refrigeration units at each machine . . . A 1.5-hp compressor is used . . . Compactness of unit conserves floor space and requires little maintenance . . . Dimensions, formerly running 0.003 in. to 0.008 in. oversize and concentricity requirements, are now being controlled to 0.001 in. total tolerance.

By Wayne Stone
Process Engineer
Bridgeport-Lycoming Div.
Avco Mfg. Co.
Stratford, Conn.

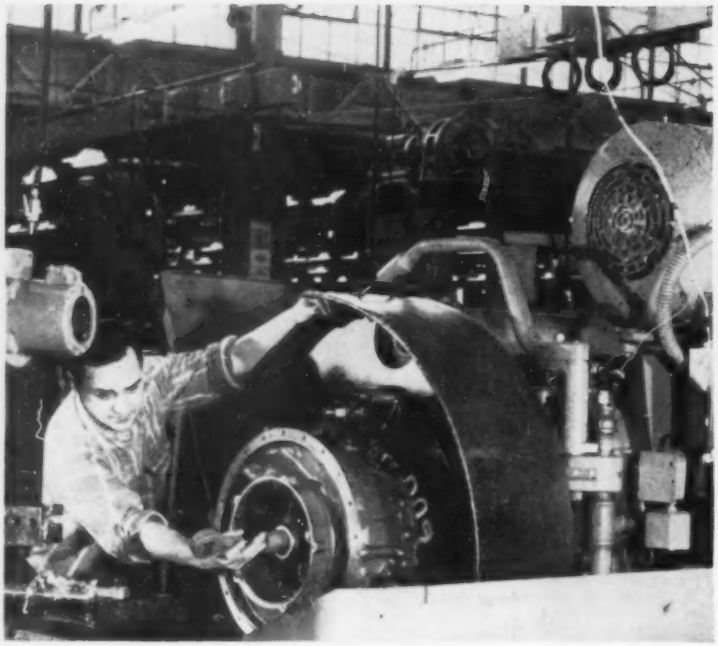
◆ DIMENSIONAL CHANGES due to heat generated by cutting tools during machining operations become a major problem when close tolerances are required, the workpiece material is highly sensitive to heat, the size of the part is massive and its shape complicated. Rising temperatures in summer months also contribute to size variations. For some types of work being processed at the Bridgeport-Lycoming Div. of Avco Mfg. Co., only a moderate temperature change is sufficient to cause expansion, warping or lack of concentricity in parts being machined.

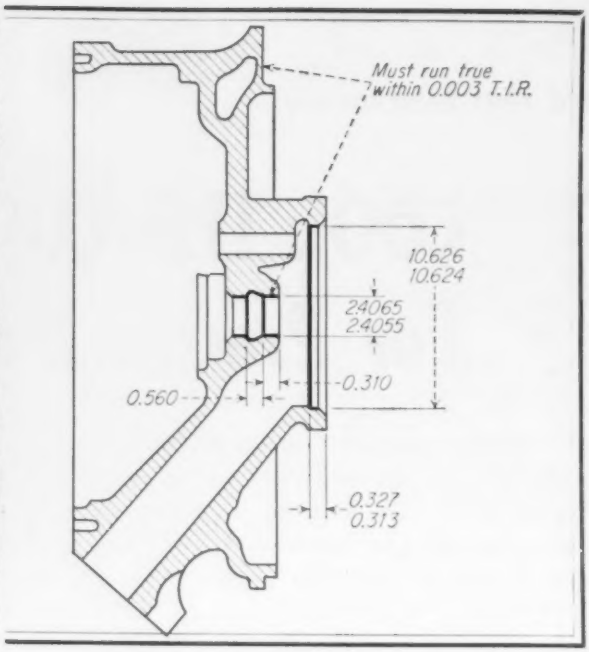
In rough and many semifinish cuts normal application of coolant to the work is sufficient to overcome the effects of heat since dimensions are not held as close and parts are usually remachined to finish size. The problem becomes more acute in finish machining, and in many cases, fluctuating coolant temperatures are responsible for spoiling the work. To overcome this, parts may be cut undersize or oversize in an attempt to compensate for temperature variations when the part is checked at gaging temperature. This procedure is complicated because allowance must be made for temperature changes due to the cutting action and also varying room temperatures.

Another method used for lowering coolant temperatures consists in placing dry ice in the coolant sump. Maintaining constant coolant



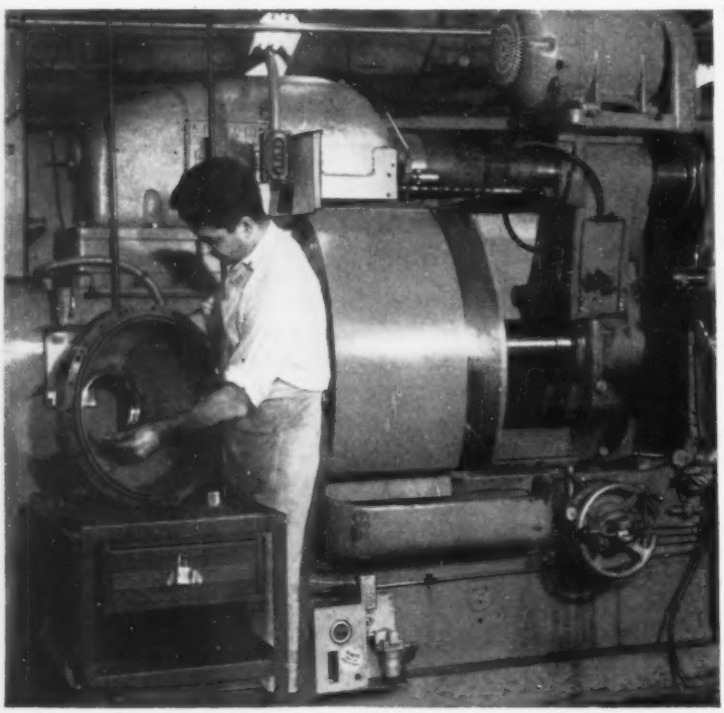
REFRIGERATING UNITS are used extensively on machine tools in supercharger cover line at Bridgeport-Lycoming

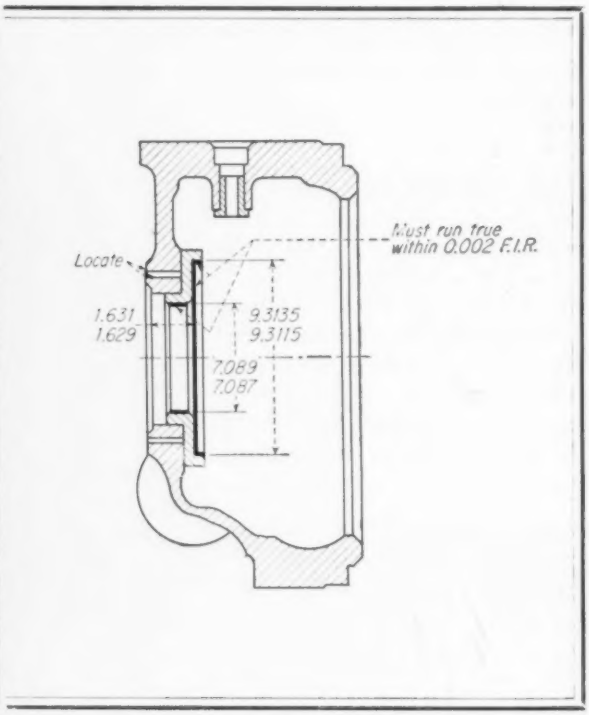




Supercharger Rear Housing

MACHINE—Foster Fastermatic turret lathe.
OPERATION—Finish bore front and center hole.
Part is locoated on rear flange and must run true within 0.003-in. total indicator reading. Before installation of refrigerating unit the 2.4055-2.4065-in. dimension varied as much as 0.006 to 0.008 in.



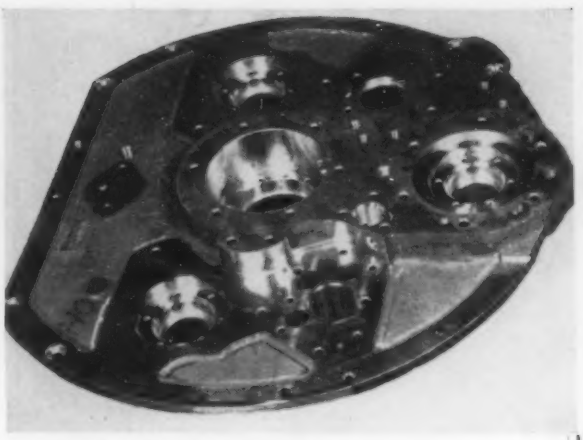


Crankcase Front Section

MACHINE—Bryant internal grinder.
OPERATION—Finish grind bearing liner.
Steel bearing liner is pressed into magnesium bore and then ground, as shown. The part is located and clamped against the rear face and the magnesium bore is indicated to run dead true before machining. Before installation of the refrigeration unit the bearing was running 0.001 to 0.0015 in. out of round.

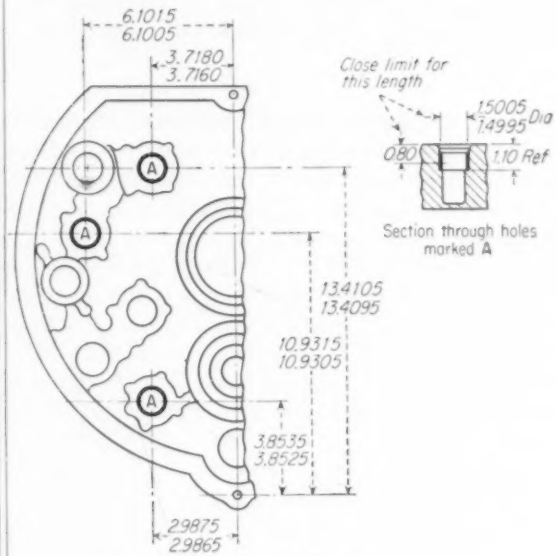
temperatures by this method however, is extremely difficult. The method is also unsuitable since the shop is dependent on a steady supply of dry ice to a number of machine locations. Placing dry ice at each machine presents storage difficulties and adds to maintenance work at the machine.

In machining the major parts of the R-1820 radial engine being manufactured for the Air Force at the Bridgeport-Lycoming Div. of Avco

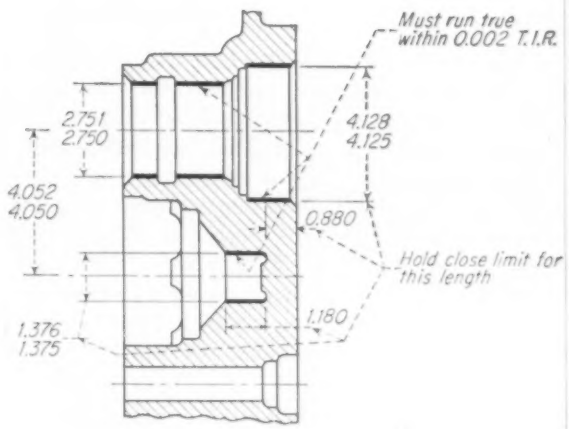


Supercharger Cover

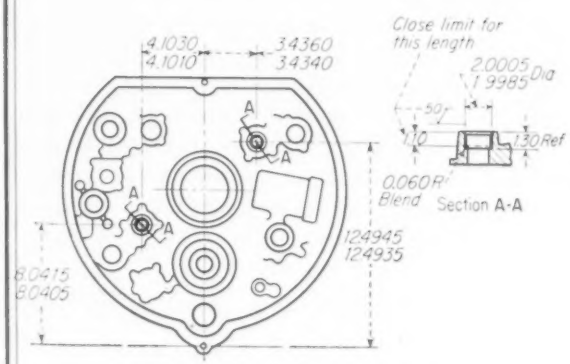
Front and rear views of supercharger cover, left and right. Due to the many interrelated and closely-held bores, the greatest difficulty was experienced in holding size due to heat change.



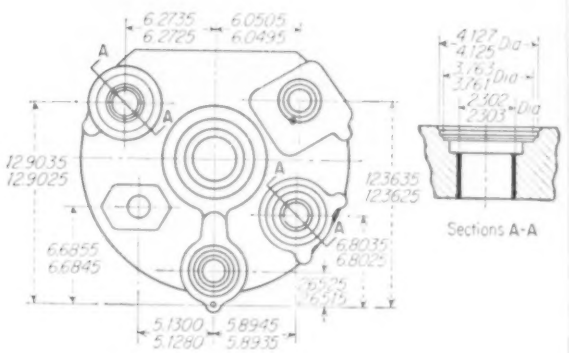
MACHINE—Heald Boramatic
OPERATION—Finish bore 3 holes.



MACHINE—Excello boring machine
OPERATION—Finish bore and counter bore, starter bore and intermediate bore.

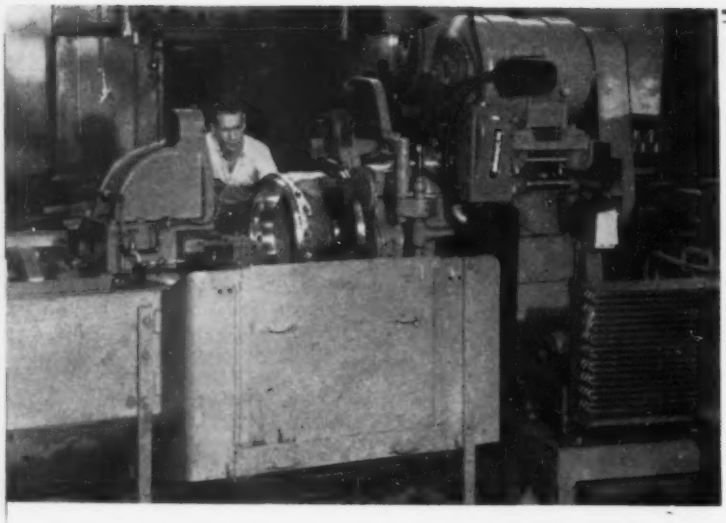


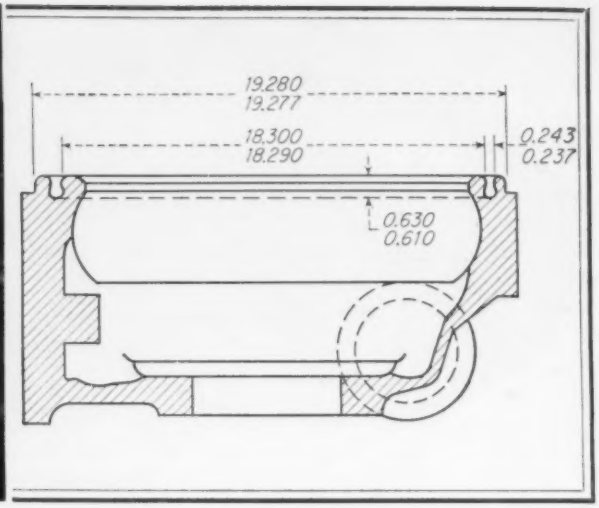
MACHINE—Excello boring machine.
OPERATION—Finish bore 2 holes.



MACHINE—Heald Boramatic
OPERATION—Finish bore and counter bore 5 holes.

Before installation of the refrigeration unit the center to center dimensions of these holes varied as much as 0.001 to 0.003 in. outside limits.





Crankcase Front Section

MACHINE—Foster Fastermatic platen.

OPERATION—Finish turn pilot flange and groove. Part is located on hub face and in small bore. When part is finished the 19.277-19.280-in. OD must run true with the shoulder face within 0.002-in. total indicator reading. Before installation of the refrigerating unit shown at right, this OD was running 0.004-0.005 in. outside limits.

Mfg. Co., under license by Wright Aeronautical Div., Curtiss-Wright Corp., maintenance of the coolant at gaging temperatures is of prime importance. These parts, such as supercharger housings and crankcase sections, being made of magnesium are highly sensitive to temperature variations. Their large size makes it difficult to control dimensions over a large area, since a massive bulky piece tends to retain more heat than a smaller lighter one. Added to these complicating factors are the many interrelated and closely held bores, together with tight concentricity requirements.

When the Bridgeport-Lycoming plant at Stratford, Conn., first started production early in 1951, it was quickly recognized that varying coolant temperatures were responsible for a considerable number of rejects due to expansion of the parts during machining. This was further emphasized by the approach of summer temperatures. Dimensions calling for an overall tolerance of 0.001 in. were found to be running anywhere from 0.003 in. to 0.008 in. over size and concentricity requirements.

Cutting the parts undersize and using dry ice in the coolant sump proved to be inadequate attempts to control size variations. It was then decided to place a coolant refrigeration unit at each of the machines performing these operations. These units developed with the cooperation of the Connecticut Ice Machine Co. contain a 1.5-hp compressor similar to those used in a refrigerator or an air conditioning system. A thermostat in the coolant sump is used to control the coolant temperature which is kept between 68° to 70°F. The entire cooling unit is mounted on one base to make it compact and reduce floor space requirements. With these units, major parts are now being produced within tolerance requirements.

The effectiveness of the first units was responsible for the installation of 30 of these units on various machines including turret lathes, boring machines and internal grinders. The extent to which these refrigeration units have been applied in the Bridgeport-Lycoming plant can be seen in the view of the supercharger cover line shown on the first page of this article. Examples of these jobs shown here, together with data on size variations obtained before installation of refrigeration units, show the difficult dimensions that are now being met through controlling coolant temperatures.

NEW FILMS

"New Horizons," is a 16-mm film in color and sound, illustrating processes used in making enameled cast iron, enameled steel plumbing fixtures and vitreous china. The film contains basic sequences tracing steps of manufacture from raw materials to finished products. Universal-Rundle Corp., New Castle, Pa.

"Industrial Film Bibliography." An up-to-the-minute supplement to the film bibliography published several months ago by the National Metal Trades Assn. has been prepared. Price to nonmembers: Supplement, 50¢; bibliography, $2.00. National Metal Trades Assn., 122 S. Michigan Ave., Chicago 3.

Pays for itself—

Automatic Feeding Device SPEEDS Machine Operations

By W. G. Patton
Asst. Technical Editor

◆ A rotary hopper-type feeder tumbles, selects and feeds small parts automatically to any of a variety of machines at a fast, dependable rate . . . Costing from $400 to $1500, this custom-built feeder often pays for itself in a few months from savings in production costs.

◆ It conserves manpower, maintains uniform production and boosts output substantially . . . Used in assembling, testing, drilling, riveting and other operations, it promises to extend the trend toward automation.

◆ AUTOMATIC SELECTIVE FEEDING of small parts to machines is being done in a wide variety of operations with a rotary hopper-type device. This fast, dependable method has replaced slow, tedious manual handling in many plants. It has boosted production, released manpower for other jobs and cut costs substantially.

Early in World War II, 30 and 50-caliber bullet cores were hand fed into grinding machines. This operation alone required hundreds of workers to turn out the millions of bullets needed by our armed forces.

In one bay of a bullet core plant, 75 centerless grinders were used to grind the outside diameter of the cores. Operators picked up the cores singly and visually selected the proper position for feeding the core point into the grinder. Each machine had an operator and each three had an inspector. To keep up production, industry had to struggle for manpower as well, as well as for floor space.

Engineers from the Detroit Power Screwdriver Co. developed an automatic hopper-type selective feeding device, shown in Fig. 1, which could hold 35 lb of bullet cores. It tumbled, positioned and automatically fed the cores into the grinding machine at double the previous rate. Uninterrupted production during the 24-hr work day increased output even more. At the height of the manpower shortage, 75 men were transferred to other important wartime work.

The devices used today are an outgrowth of

FIG. 1—This automatic hopper-type feeder tumbles, positions and feeds bullet cores to a grinding machine at double the previous hand-fed rate. Use of 75 such units freed 75 men for other essential work.

Parts from 0.060 to 3 in. in diam have been successfully fed automatically . . . Feeders save on manpower, speed production . . .

automatic machines designed almost three decades ago. Early models had a split screwdriving spindle arrangement and a clutch to prevent overdriving of screws. Refinements over the years have contributed in an important way to the development of the automatic feeding devices used today on drilling machines, riveting machines, punch presses, screw machines, assembly machines and grinders.

Each specific job must be considered on the basis of self-orientation, rate of production and cost before a decision is made to automate. Because each job presents different problems, some engineering and development work is usually necessary.

One problem to consider is whether the part has sufficient strength to withstand tumbling. Parts which tend to tangle or intertwine present a difficult or impossible problem. Sometimes, parts like closely wound springs can be fed satisfactorily.

Tumbling of the parts brings a constant percentage of them into a properly oriented position for feeding. For example, if screws for thread rolling are fed at the rate of 300 per min, 500 to 600 must be picked up and fed into the hopper each minute.

While the hopper rotates at a constant rate, a specific number of feeding slots must pass the track opening each minute. By design, a consistent flow of parts to the machine is assured at all times although the rate of flow may vary.

Hopper speed varies with the diameter of the hopper. For the six diameters ranging from 8 to 30 in., the speed is 9 rpm up to 16 in. and 5.5 rpm for the 24 and 30-in. hoppers. Some machines, such as the one in Fig. 2, may have as many as nine feeders in a 6-ft radius.

Articles as small as contact pins for vacuum tubes, having a 0.060-in. diam and a 0.125-in. length, have been fed successfully by automatic selective feeders. Flat disks and hex nuts up to 2½ to 3 in. diam have also been fed automatically.

For uniform feeding, parts must pass through a series of guards, selector pins, jumping gaps and trapping devices. If they feed naturally in a certain position, turnover devices can be used to position them properly in respect to the assembly. For example, bolts tending to move down the track head first can be inverted if necessary.

Feeder tracks are custom-made to fit each

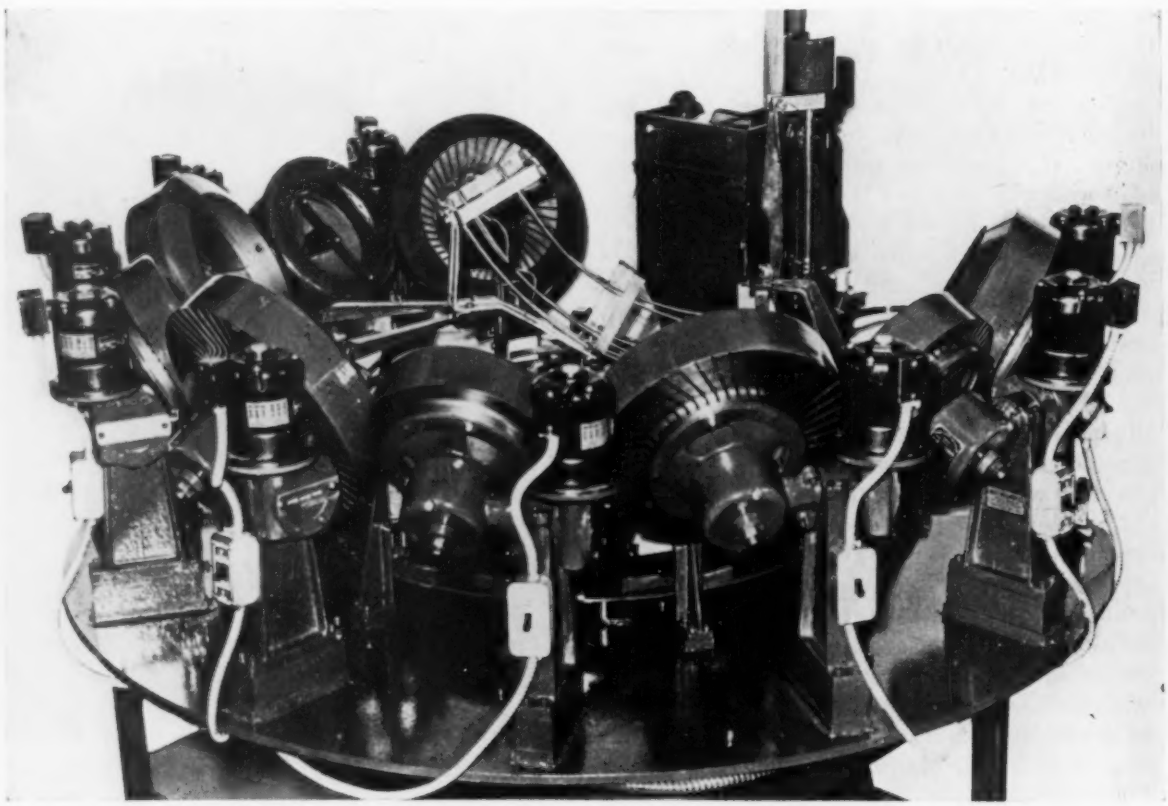


FIG. 2—As many as nine automatic feeders are placed in a 6-ft diam. Each feeder on this multiple dial-type machine can be operated individually. These devices will handle various shapes and sizes.

particular job. If necessary, the track can be bent laterally, vertically or horizontally as much as 180°. A track plate covers from one third to one half of the track. Foreign materials or jammed pieces can be seen readily and removed by simply pushing the parts back up the track without stopping hopper.

Parts are usually fed into the die or fixture at a uniform rate by an escapement device attached to the track and cycled with the movements of the machine. On a punch press, the upstroke may actuate a solenoid-operated escapement which releases the parts into the die. If more than one piece is fed at a time, an adjustable escapement can be used to release the desired number of pieces. A foot or hand switch may be used to feed from 2 to 24 screws or rivets into a box or bag.

Where hopper feeding of all component parts of an assembly is impractical or impossible, the machine can be cycled to conform with those operations which must be done manually. This may be necessary when handling paper washers and insulators.

Before determining whether a piece is suitable for hopper feeding, its center of gravity, dimensional relationships, weight disrtibution and possibility of entanglement must be considered. The piece must be able to orient itself.

Automatic selective feeders are now used in many applications. One manufacturer had been assembling plastic wheels to axles for toy automobiles by slow, high-cost manual operations. To improve production, he installed three selective feeding units which enable him to feed the parts, attach the wheels and remove the assemblies automatically. A two-machine installation now makes from 55 to 75 assemblies per minute and has freed 38 employees for other work. Fig. 3 shows how automatic feeders are used in one toy-making operation.

IF IT CAN BE HOPPER FED, THEN—

Production can be greatly increased
Direct labor cost is far less.
Operators are freed for other essential work.
Uniform production is sustained all day.
Loading of parts is done in bulk rather than singly.
Feed rate is accurate.
Inspection costs are often reduced.

In another application, automatic feeding of hose couplings has insured higher product quality and sustained production. And in still another, hinge pins which were positioned manually at a slow and erratic rate are now fed, positioned and pressed into place automatically. Human error has been eliminated and production increased substantially.

Hopper-type feeders have increased output of machines for broaching, chamfering, grinding, deburring, testing, drilling, tapping and others. Fig. 4 shows how small four rivets are fed and placed simulaneously in a hub clutch-release assembly. Feeders can be used for dial-type as well as in-line machines.

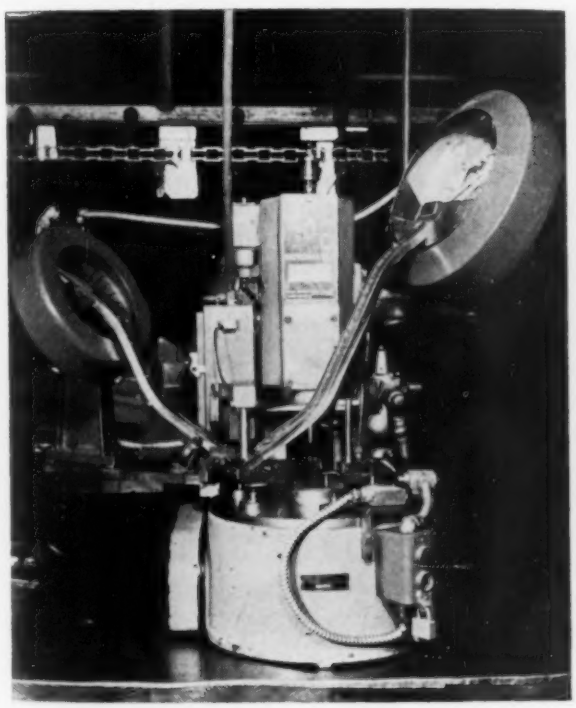


FIG. 3—Automatic feeding and assembling of plastic wheels has speeded operations considerably in a large toy manufacturing plant. These feeders replaced slow, tedious manual assembling methods.

FIG. 4—Four rivets are fed and placed into a clutch release assembly simultaneously. Inserting rivets had been a time-consuming operation. Units can be used on dial type and in-line machines.

Both ends against the middle—

DOUBLE-END Batch Furnaces Speed heat treatment of small parts

◆ Charging and discharging of containers is done simultaneously from both ends of the furnace . . . Gradual, constant rate of heating and accurate cooling cycles are essential over the long cycle time . . . Temperature controls of the positive type maintain rigid firing schedules . . . Air at 1-lb pressure from individual turbo compressors feeds the gas through a one-valve automatic proportioning control.

◆ HEAT TREATING of small carbon-graphite parts poses many and varied problems. It requires careful materials handling, accurate control of heat cycles, and an efficient load pattern. To overcome such problems, the United States Graphite Co., Saginaw, Mich., uses rigid heat-treating cycles and program control for its ten double-end oven furnaces.

Charges packed closely in containers require long cycles. They are adaptable to in-the-furnace handling, characteristic of the batch-type or in-and-out box furnace. However, there are the problems of multiple container handling and efficient use of hearth space. Containers at the rear of a single-door furnace must be moved across the entire hearth length and then only after the forward charges have been moved. This is not only time consuming, but difficult, especially when charging fragile parts.

To facilitate production, material being treated is now handled on transfer cars when moved to and away from furnaces. Within the furnace, charging and discharging is done simultaneously from both ends. This procedure speeds handling, and by minimizing the number and extent of charge movements, reduces wear on furnace hearth plates.

The baking or heating stage in making carbon brushes and similar items is extremely critical. To insure uniform satisfactory results, this operation requires strict control over the rate of incease in temperature, its duration and rate of cooling during the latter part of the cycle.

The critical rate of temperature increase for such treatments must be maintained continuously and automatically. This requires special consideration in setting up control procedures and equipment. A gradually changing heating rate and accurate cooling speed are essential over a time cycle of considerable duration.

Continuous chart recording and indicating controllers ranging from 0° to 2100°F with cam-type program control provide delicate control and balance of heating and cooling. One set of instruments for each furnace is mounted on an individual panel at a control location in an adjoining room. A heating rate interrupter operates from the cam-type controller. The cam, cut for the complete heating and cooling curve, is constantly motor driven.

A cam follower synchronizes the controller interrupter with cam movement, and opens and closes a butterfly valve in the airline manifold. This airline supplies combustion air at a 1-lb pressure from individual turbo compressors to the low-pressure burners on each furnace.

The one-valve control, automatic proportioning feature, readily adapts the gas-burning equipment to an off-on type of control. Air under pressure is the inspirating or entraining medium for gas at zero pressure. It also automatically regulates the gas required for constant-correct fuel-air ratio. Shutting off the air interrupts heat input for the required time. This action rigidly maintains the desired temperature cycle. It also controls overshooting which would be detrimental to product quality.

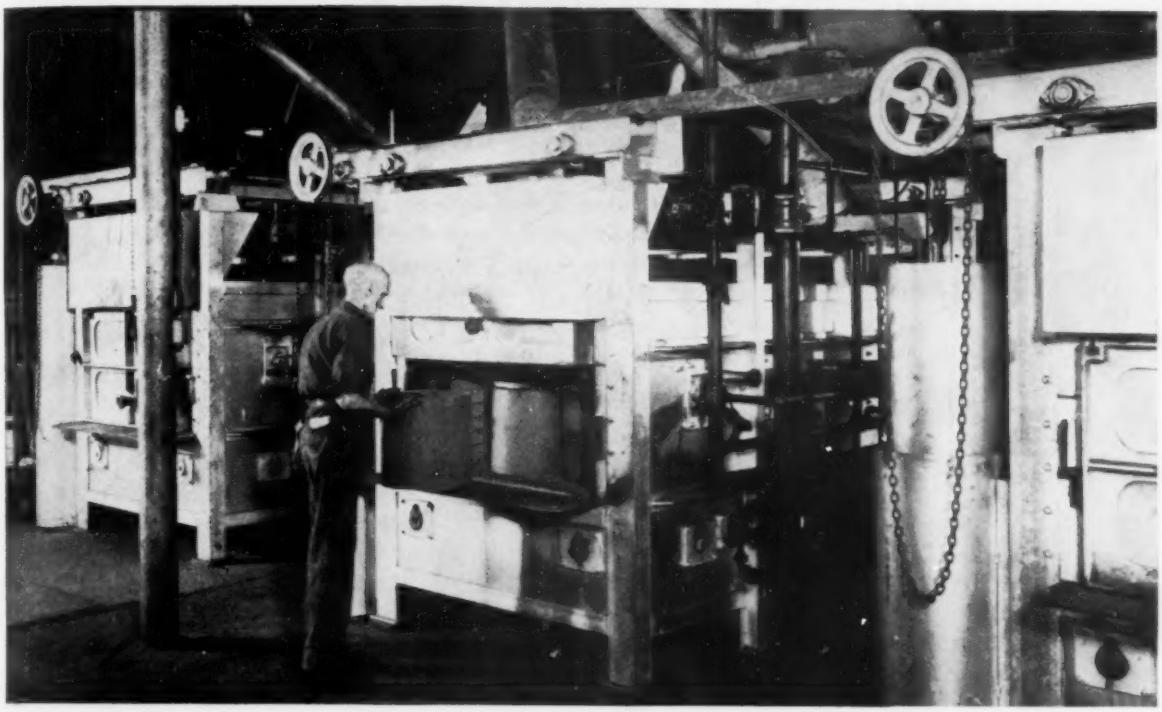
The heating rate for these carbon parts must continue to increase when soaking temperature is reached. Because this rate of increase is very critical, it must be accurately maintained.

Products of combustion are not deleterious to the carbon-graphite parts being treated. Therefore, furnaces are direct-fired. Two banks of burners are located in each side wall. One bank fires over the hearth at an angle following the contour of the furnace arch. The other bank fires under the hearth between strategically placed pier supports. Burners in opposing banks are positioned alternately for even heat distribution along the furnace length.

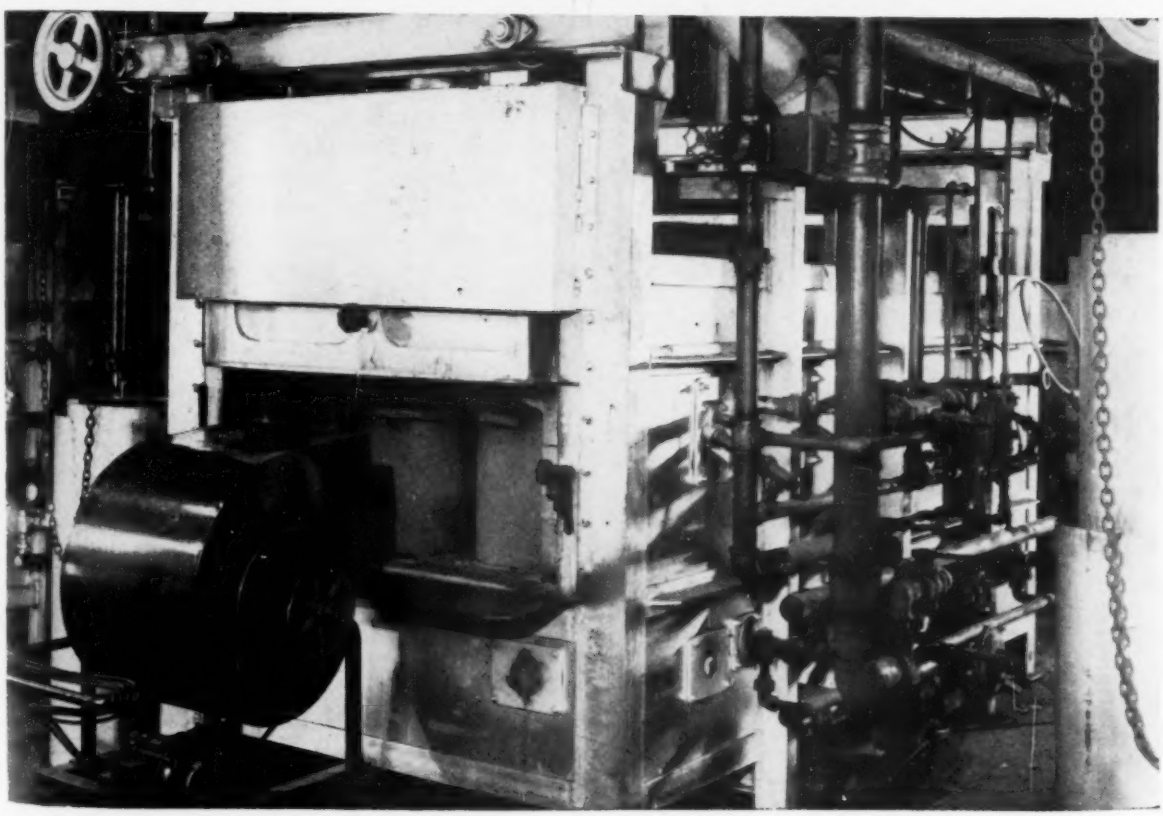
Firing positions of these burners swirls the heated products of combustion within the heat-

ing chamber. Even distribution of temperature is maintained while detrimental direct flame impingement charge is prevented. Adequate flues vent the products of combustion from hearth level and discharge them at the top of both furnace doors. From this point, ducts convey the burned gases to several main outside vents.

At a predetermined point in the cooling curve, doors at both ends of the double-end furnace are opened. A portable fan, moved in front of one of these openings, forces room air through the furnace. Final stages of cooling are greatly accelerated and overall cooling time reduced. This also reduces nonproductive furnace idle time and speeds removal of the charge.



CHARGING one of the direct gas-fired furnaces with saggers containing formed carbon parts.



PORTABLE fan in position during accelerated cooling portion of the heat-treating cycle.

Help for engineers—

NEW METHOD Speeds Calculations for Forging Dies

By J. A. Amaral Gurgel
Tool Engineer
Flint, Mich.

◆ Calculation of profiles of upsetting dies and visualization of material flow in forging operations are simplified with this graphical process for calculation developed by the author.

◆ Method is applicable to dies used in forging parts which are solids of revolution . . . Material requirements can be estimated . . . Special plastic template simplifies use of method.

◆ SIMPLE AND RAPID calculation of forging die profiles and vizualization of material flow in forging operations is possible with a novel graphical method. The method solves many problems involved in the calculations of dies for forging presses in which the part is a generated solid of revolution.

A solid generated by the revolution of an area around an axis, Fig. 1, has special properties. Its volume can be found by dividing the solid into a great number of slices cut perpendicular to the center line. These disks have a radius R_i and Thickness Δ_x. Volume of each disk will be $\Delta v = \pi R_i^2 \cdot \Delta_x$.

Total volume will be the summation of all the disks. To find the exact volume of the solid, divide the solid in an infinite number of disks, which means that Δ_x has to approach zero. In this case:

$$V = \int_0^h \pi R_i^2 dx$$

Calculation of this formula will give the volume of the solid. But this volume can be more easily calculated graphically.

To find the volume of the small disk, multiply the square of its radius by π and by Δ_x. The square of the radius can be graphically found with the help of the algebraic curve of equation $Y = R^2$, Fig. 2. A number can be multiplied by π by using the construction, Fig. 3, in which the line L makes an angle of $\alpha = \tan^{-1} \frac{1}{\pi}$.

If these two lines are put together as shown in the Fig. 4, graphical integration of the volume of the generated solid of revolution is possible.

Fig. 4 is the basis for all drawings. With a plastic template of the curve $Y = R^2$ and the angle $\alpha = \tan^{-1} \frac{1}{\pi}$ as shown in Fig. 5, the part is drawn with its center line coincident with line Y in a convenient distance from the R line.

A simple solid of revolution, a cylinder of radius R and height h, Fig. 6, may be used for illustration. Volume of the cylinder will be $V = R^2 h\pi$. Total volume of the part is obtained from the graph by measuring the area of the rectangle a, b, c, d.

$ad = MN = R^2$ (By construction of the parabola $y = R^2$)

$cd = \pi h$ (By construction of the slope of line M, where 1 in. vertically corresponds to 3.1416 in. horizontally)

The area abcd will be $ad \times cd = R^2 \times \pi h$, the volume of the cylinder.

Volume of a ring K, Fig. 7, and the size of the rough stock needed to produce this ring can be found in a similar manner. Starting with the layout, Fig. 4, the area abcd represents the volume of the ring because the ring can be considered as the volume difference between two cylinders with the same height.

If we drop the area abcd to the center line R, we still have the same volume for the part because area A = area A'. The area A gives an idea of the solid, and facilitates manipulating the volume as an area. By tracing the rectangle a'b'c'd' back, the shape of the stock needed for production of the part may be found. A'D' vill be the radius of that stock.

In upsetting a shaft for a pump, it is necessary to find the extra length of bar required to upset the piece, Fig. 8. The volume of the section to be upset is the sum of the area A and C. By planimeter the area A was found. The area B is made equal to area A, and represents the volume to be added in the end of the bar to provide the extra metal to fill the die cavity.

The part was drawn to a scale of 2:1 and the volume, if needed, can be calculated by dividing the area A plus C by the cube of the scale or 8. Although the volume is not needed, the extra length can be found by measuring Δ_x with the same scale of the drawing.

The movement of material between two stages of upsetting in an 81-mm mortar shell is shown in Fig. 9. General procedure in calculating the dies is to start with the die for the final shape and work backward to the raw material die. The known shape of the shell is drawn with heavy lines and marked 1, 2, and 3 . . . . . 26. Dimensions of the die that precedes this operation are sought.

The shape of the punch for the preceding operating is determined by the experience of the die designer. Both part and punch are projected with the help of the parabola and tne line M. From these are obtained an area representing the part volume and an area representing the punch volume.

It is only necessary to drop the area of tne

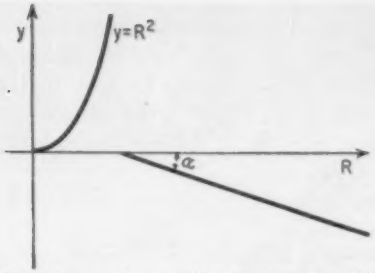


FIG. 4—Basic layout for graphical method combines the line and curve shown in Figs. 2 and 3.

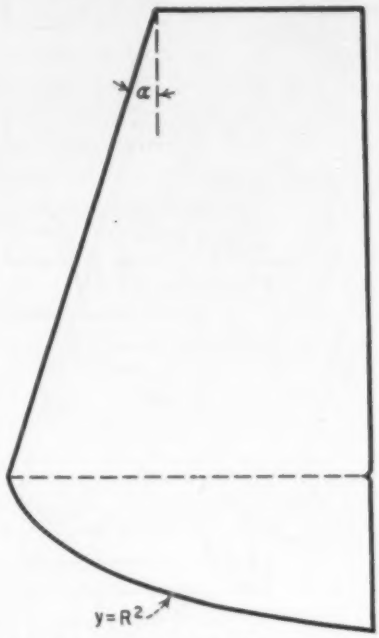


FIG. 5—A plastic template is used to trace the parabola and line L.

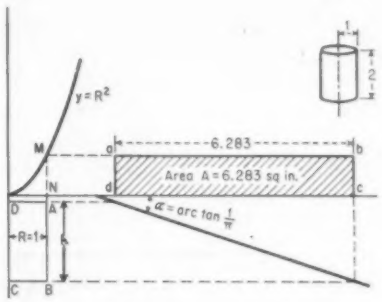


FIG. 6—Volume of a simple solid of revolution, a cylinder of radius R and height h, is readily obtained.

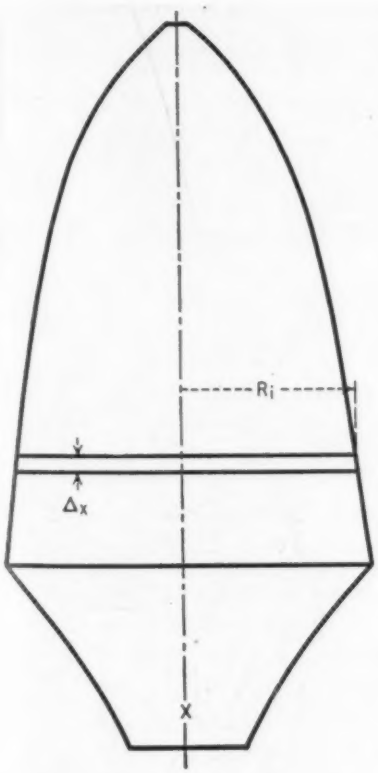


FIG. 1—A typical generated solid of revolution. All cuts perpendicular to axis X are circumferences.

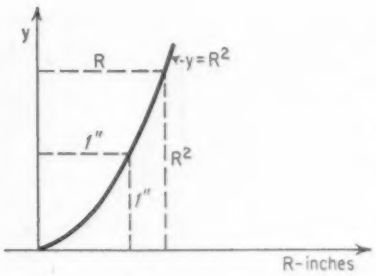


FIG. 2—Algebraic curve $Y=R^2$ may be used to establish the square of the radius graphically.

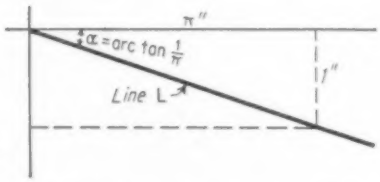
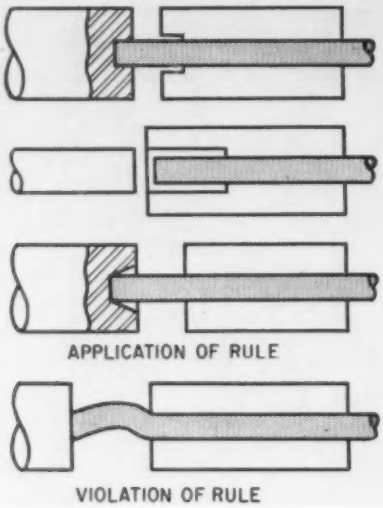


FIG. 3—A number can be multiplied by π by using a construction in which line L makes an angle of $\alpha = \tan^{-1}\frac{1}{\pi}$.

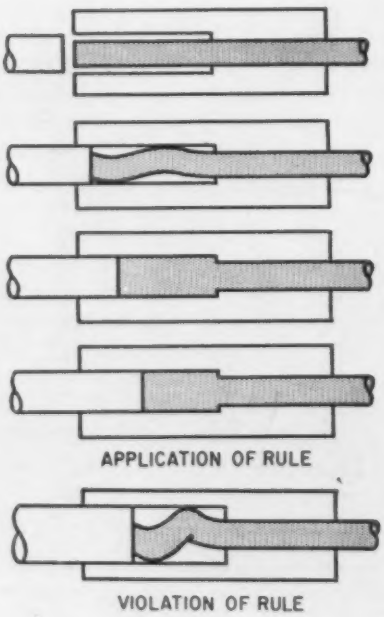
part close to the area of the punch. Some minor adjustments, such as compensation of the areas A, B, C and D, have been made to facilitate location of the part and to help material flow. By tracing back the outside profile, the profile needed in the die of the preceding operation is found, Fig. 10.

To facilitate drawing it is possible to change the angle α as was done in this application. When angle α is changed the area projected does not represent the volume of the part, but is proportional to it. When a 45° angle is used the volume of the part is π times the area projected. Since in many cases we are not interested in the volume of the part, this may facilitate drawing.

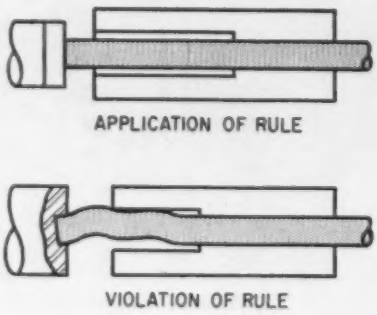
These rules govern design of upset forging dies



The length of unsupported metal that can be upset in one blow is about three times the diameter of the bar.



Lengths of metal more than three times the bar diameter can be upset in one blow if the upset diameter is not over 1½ times the bar diameter.



In an upset requiring more than three diameters of the metal in length, and in which the diameter is to be 1½ times the bar diameter, the amount of unsupported metal beyond the face of the die must not exceed one diameter of the bar.

Courtesy National Machinery Co.

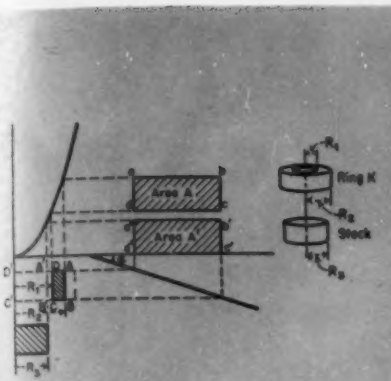


FIG. 7—Volume of a ring K and the stock needed to produce the ring can be found by the method used in Fig. 6.

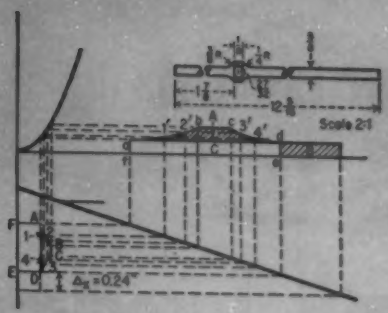


FIG. 8—Extra length of bar needed to upset a shaft for a pump is found by the method shown above.

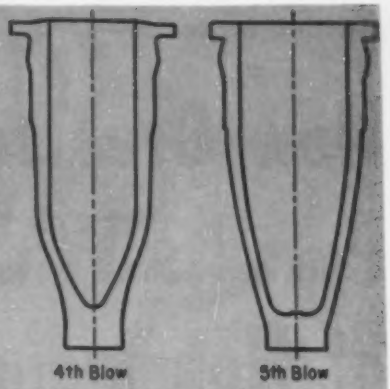


FIG. 10—By tracing back the outside profile found, the profile of the preceding operation is found.

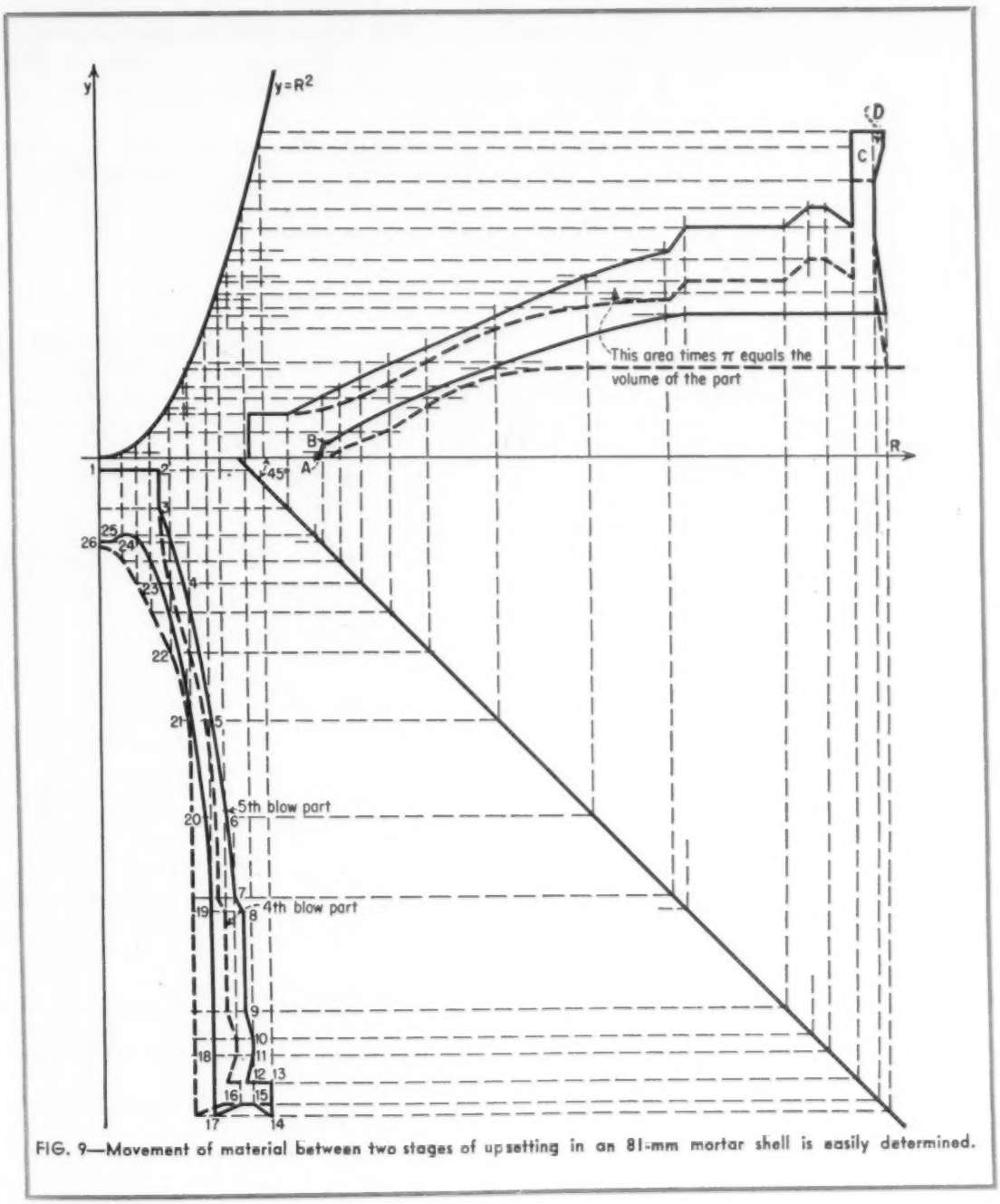


FIG. 9—Movement of material between two stages of upsetting in an 81-mm mortar shell is easily determined.

Gamma hematite—

New Ore Treatment Permits Wide Use of Nonmagnetic Taconites

◆ By a reduction-oxidation process hematite can be converted to magnetic form permitting easy separation . . . Utilization of many low-grade taconites is now more economically feasible.

◆ Pilot plant operations on a continuous basis have been satisfactory . . . Hydrogen and producer gas are both satisfactory fuels . . . Metal furnace operating at 930°F was used . . . Average recoveries. 95 pct of gamma hematite containing 63 pct Fe.

◆ MAKING MARKETABLE IRON ORE concentrates from taconite, or iron range formation material, has received a great deal of attention within the past few years. Although most of the base metal production in this country is obtained from concentrates produced from ores which are relatively much lower in grade than taconite, the problem of concentrating low-grade taconite ores has not been easily solved. Factors are the low unit value of iron ore, the tremendous tonnages used, and the variability of the formation material.

A careful mineralogical analysis of 23 individual samples from the Mesabi Range showed that their iron contents varied from 24.6 to 44.2 pct, and that they contained six different major iron bearing minerals in varying combinations with six major gangue minerals. After eliminating the lower slaty horizon material of the Mesabi Range, which requires extremely fine grinding for liberation, and the minerals which are low iron content silicates, the problem of concentrating materials with a 60 pct variation in iron content, containing four major iron minerals and varying in liberation point from ½ in. to 270 mesh, is still a somewhat formidable assignment.

Of the four, conversion of hematite to magnetite followed by magnetic separation is the most feasible if the economics can be made attractive. To improve the economics, two main lines of attack are open: (1) the development of a low temperature process to cut the initial heat requirement, and (2) the development of a process in which heat may be recovered in usable form. A process known as the reduction-oxidation process accomplishes both of these objectives and makes the utilization of low grade taconites much more practical.

The reduction-oxidation process has four basic steps. The first step is drying of the raw ore and preheating it to reaction temperature. The second step is the reduction of the hematite to artificial magnetite by means of one or both of the following reactions:

$$3Fe_2O_3 + H_2 \longrightarrow 2Fe_3O_4 + H_2O - \text{heat}$$
$$3Fe_2O_3 + CO \longrightarrow 2Fe_3O_4 + CO_2 + \text{heat}$$

The third step of the process is the controlled reoxidation of the artificial magnetite to *gamma* hematite. This reaction is highly exothermic and is represented by the following equation:

$$4Fe_3O_4 + O_2 \longrightarrow 6Fe_2O_3\,(\gamma) + \text{heat}$$

The final step in the process is the cooling of

This is a summary of an important paper "Reduction-Oxidation Process For The Treatment of Taconites" presented at the 36th Conference of Blast Furnace, Coke Oven and Raw Materials Committee, AIME, held in Buffalo. The paper was presented by F. M. Stephens, Jr., Benny Langston and A. C. Richardson, Minerals Processing Div., Battelle Memorial Institute, Columbus.

The All-Metal Pilot-Plant Furnace

Used in Iron Ore Tests at Battelle

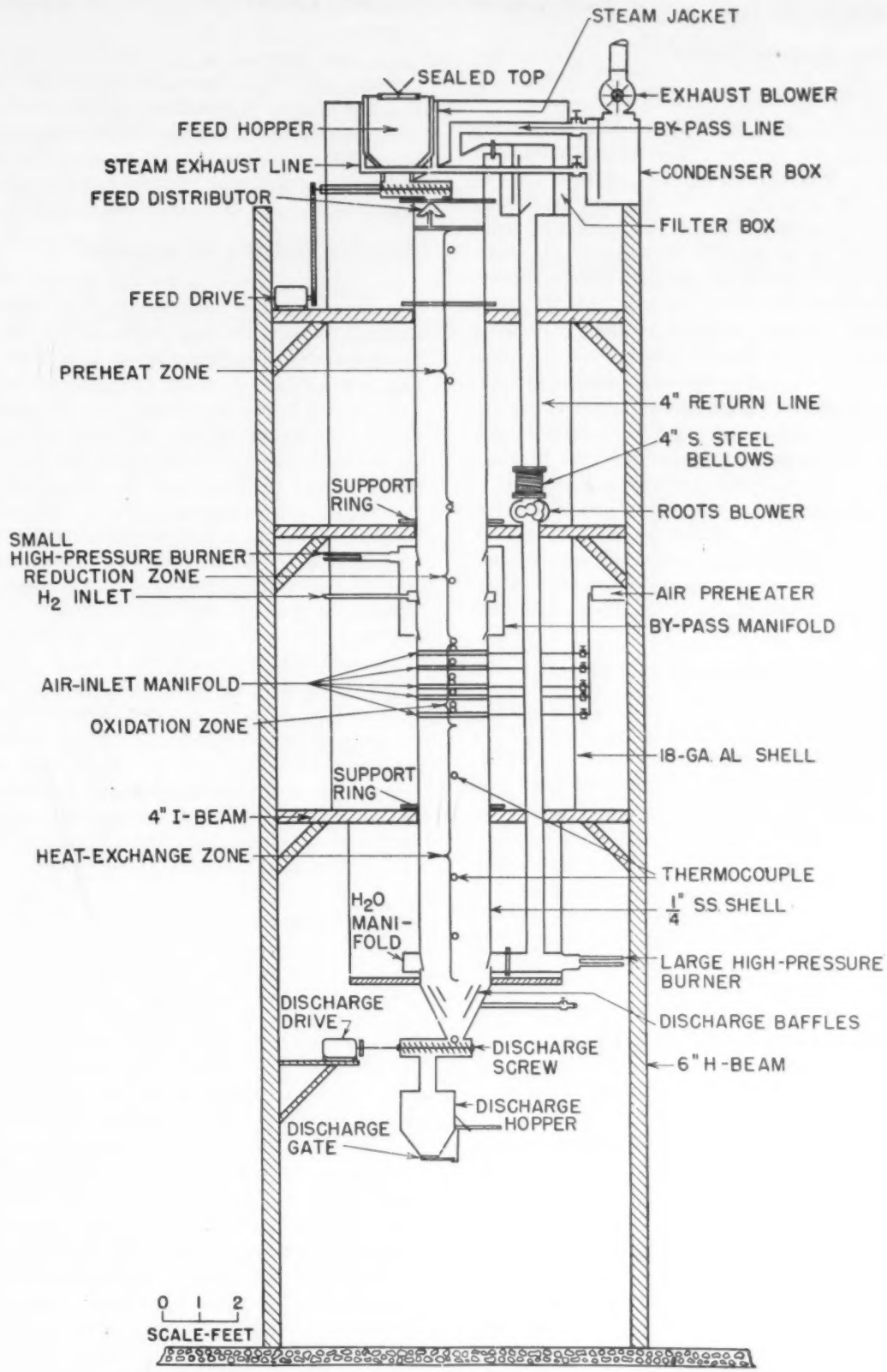


FIG. 1—All metal furnace, operating at 930°F was used at Battelle to test the reduction-oxidation process.

the *gamma* hematite to recover its sensible heat.

Within limits it is possible to operate the reduction-oxidation process in such a manner that it is cyclical with regard to heat requirements. The limitations are easily met when the process is used to treat oxidized taconites. The first of these limitations consists of having a sufficient quantity of iron present in the sample

Close temperature and atmosphere control, good heat transfer system needed . . .

as hematite to form enough artificial magnetite to furnish the required heat in the oxidation step. The feed should contain at least 20 pct Fe present as hematite. The second limitation is that the artificial magnetite produced from the ore must be readily reoxidized at a temperature low enough to produce *gamma* hematite. The final limitation is that the ore must be readily reduced to artificial magnetite at a temperature below that required for reoxidation.

Most of the oxidized taconites examined contain 20 to 40 pct Fe as hematite which can be reduced at temperatures of 750° to 840°F and may be reoxidized to *gamma* hematite at temperatures up to 930°F. A heat balance for a typical taconite being treated by the reduction oxidation process is shown in Table I which indicates a theoretical amount of excess heat equal to 23 pct of the heat requirement. This excess heat is available to balance radiation and other heat losses.

Need close process control

To test the feasibility of the reduction-oxidation process on a continuous basis, a small pilot plant furnace was constructed. This unit has a nominal capacity of 200 lb of ore per hour.

The main requirements of the reduction-oxidation furnace are close temperature control, a good heat transfer system, and close control of the furnace atmosphere. Previous magnetic operations in which hearth furnaces, rotary kilns, and shaft furnaces had been used indicated that the only type of furnace which met these requirements was a shaft type unit. Two features, not normally a part of a shaft furnace, were required, (1) a by-pass system for passing heat transfer gases around the reduction zone, and (2) an external line for recycling the heat transfer gas.

The comparatively low temperature of 930°F used in the reduction oxidation process made it feasible to construct the furnace of metal rather than refractories. For the highest temperature zones, the reduction zone with a reducing atmosphere, and the oxidizing zone with an oxidizing atmosphere, an 18-8 type stainless steel was chosen. For the remainder of the furnace, regular cold-rolled steel was used.

The design of the original furnace consisted of a stainless steel tube 2 ft in diam x 14 ft long. This tube is surrounded by 2½ ft of vermiculite insulation, held in place by a second shell of lightweight aluminum sheet mounted on a structural steel frame. The furnace is charged and discharged by screw feeders. The reducing gas enters the furnace through annular manifolds, while the air for oxidation originally entered the furnace through the draw chamber.

Burners located in the central and lower sections of the furnace are used to bring the furnace charge to reaction temperature before starting the cyclic heat operation. The exhaust line at the top of the furnace removes the excess steam from the drying operation and the gaseous reaction products formed in the reduction zone.

Converts hematite to magnetite

In normal operation, the ore is fed into the top or preheating zone where heat from the furnace gases dries and preheats the ore. The dry preheated ore then passes into the reduction zone, where contact with a reducing gas converts the hematite to magnetite. The reduced ore in turn passes into the oxidation zone where air converts the artificial magnetite to *gamma* hematite and releases heat. At the same time, the water vapor entering the bottom of the furnace serves as a heat-transfer medium, abstracting both the sensible heat from the ore and the heat produced by the oxidation reaction. The heated water vapor is then used to preheat and dry more ore, resulting in a cyclic process as regards heat requirements.

The early work with the pilot plant furnace showed that, to carry out the basic concepts of the process, several changes in the design of the furnace were necessary. Fig. 1 is a drawing of the modified furnace. To increase the gas solid contact time in the preheat and cooling zone, a 3-ft section was added to the top of the furnace and 5-ft section was added to the bottom of the furnace. In the oxidation zone, a series of air inlet pipes was installed to improve the air distribution, and thermocouples were added to ascertain the temperature in the zone. A stationary slotted cone was installed under the screw feeder to assure the distribution of fine ore across the diameter of the furnace. Fig. 1 shows the furnace substantially as it was employed for the test program on the processing of low grade taconites. The only exception was the substitution of a revolving chute for the stationary slotted cone in tests where the feed contained over 20 pct of minus 10-mesh ore.

In the initial test work with the pilot plant furnace, pure hydrogen was used as the reducing gas. Later in the program the furnace was operated with producer gas. The original tests were carried out with a feed consisting of an oxidized taconite having the composition given in Table II. In this ore, approximately ⅔ of the iron was present as hematite and ⅓ as magnetite. The gangue was primarily silica. At the start of the pilot plant work, the furnace feed consisted of minus ½-in. plus 10-mesh ore. In subsequent tests, minus 1 in. x zero ore was

employed. Some of the data collected in this test work are discussed in the following section of this paper.

There are two methods of preventing the over-reduction of iron in any reduction process. The first is based on adjusting the composition of the reducing gas so that the stable form of iron in such an atmosphere is magnetite. For example, at a reduction temperature of 750°F, a gas containing from 1 to 80 pct H and 20 to 99 pct water vapor will reduce Fe_2O_3 to Fe_3O_4 but will not reduce Fe_3O_4 to metallic iron. The second method of preventing over-reduction is to limit the amount of reducing gas used, because it requires nine times as much hydrogen to reduce Fe_2O_3 to iron as is required to reduce Fe_2O_3 to Fe_3O_4. By using twice the theoretical amount of hydrogen required to produce Fe_3O_4 it is possible to take advantage of both of these methods of preventing over-reduction. When there is insufficient reducing agent to form large amounts of metallic iron, and as the hydrogen is consumed in producing Fe_3O_4, the reaction product, water, automatically adjusts the composition of the remaining gas to a point where only Fe_3O_4 is stable.

High grade product made

In these initial tests, the pilot plant furnace was operated successfully on a cyclic heat basis for periods as long as 80 hr, and made a high grade product. Table III gives typical data obtained from these tests and shows that during the test an average of 92.3 pct Fe was converted to a form which could be recovered in a magnetic concentrate assaying 61.3 pct Fe.

After demonstrating the fundamental soundness of the process in tests with pure hydrogen, it was decided that tests should be made with other reducing gases. It was apparent that most of the available gases had compositions intermediate between producer gas and pure hydrogen. Because of this, it was decided to test the process with producer gas so that if the process worked with pure hydrogen and with producer gas, it would be operable with any of the intermediate gases such as reformed natural gas or water gas. The pilot plant furnace was equipped with a gas producer and automatic gas analyzer. A series of tests was made and the performance of the furnace, when operated with producer gas, was comparable to its previous performance with hydrogen.

Although the 2-ft diam furnace was designed for a capacity of 200 lb per hr, the test data indicated that it was capable of processing ore at much higher rates. On this basis, a capacity test was made while operating the furnace on producer gas. In this test, the furnace was placed in operation at a feed rate of 200 lb per hr with a minus ½-in. feed containing 6 pct minus 10-mesh material and held at this rate until the temperatures in the various zones of the furnace reached their proper values and the furnace was operating on a cyclic heat basis.

The feed rate was then continued at 200 lb until the original charge was completely replaced with fresh ore. The feed rate was then increased to 400 lb per hr and maintained at this rate for a period of 24 hr and then increased to 600 lb per hr and operated at 600 lb per hr for 16 hr. Table IV gives the summary test performance data.

These data show the temperatures in the reduction and oxidation zones and the carbon monoxide and hydrogen contents of the reducing gases were maintained at optimum levels throughout the test, and excellent conversions

TABLE I

TYPICAL HEAT BALANCE FOR TACONITE*

Heat Required	Btu
For evaporation of 2 pct moisture	40,750
To raise ore to 750°F	325,000
To raise H_2 to 750°F	10,000
For reaction $3Fe_2O_3 + H_2 \rightarrow 2Fe_3O_4 + H_2O$	10,250
Total required	385,250
Heat Available	**Btu**
Sensible heat from ore at 750°F	325,000
From reaction $4Fe_3O_4 + O_2 \rightarrow 6Fe_2O_3$ (γ)	148,400
Total available	473,400

Excess heat available per short ton: 473,400 − 385,250 = 88,150
* 2000 lb of ore tested containing 33 pct total iron, 22 pct iron as hematite, and 2 pct moisture.

TABLE II

COMPOSITION OF TACONITE FEED

	Pct
Total Fe	33.2
Fe^{++}	3.1
Acid-soluble Fe	33.1
Magnetic Fe	10.1
Nonmagnetic Fe	23.1
SiO_2	51.3
CaO	0.01
MgO	0.08
Al_2O_3	0.13

TABLE III

MAGNETIC-SEPARATION TESTS
Furnace Operating With Hydrogen

		Magnetic			Nonmagnetic		
Sample No.	Feed Fe, pct	Weight pct	Assay Fe, pct	Dist. Fe, pct	Weight pct	Assay Fe, pct	Dist. Fe, pct
1	36.7	56.71	60.9	96.68	41.29	3.0	3.32
3	36.4	56.70	60.5	96.41	41.30	3.2	3.59
5	36.4	55.64	60.9	93.51	44.36	5.3	6.49
7	36.5	52.27	62.1	87.18	47.73	10.0	12.82
9	36.3	52.68	61.6	89.09	47.32	8.4	10.91
11	36.4	53.50	61.6	89.86	46.50	8.0	10.14
13	36.0	55.16	61.3	93.09	44.84	5.6	6.91
Average 1-13	36.4	55.2	61.3	92.3	44.8	6.2	7.7

TABLE IV

EFFECTS OF FEED RATE

Feed Rate, lb/hr	Recovery Fe, pct	Assay Fe, pct
200	96.3	63.9
400	94.9	63.6
600	94.2	63.9

By regulating reduction temperature, 75 pct of siderite can be placed in concentrate or tailing.

of iron oxides to magnetic form were obtained. The average result for the entire run was a recovery of 95 pct of the iron at a grade of 63 pct Fe.

After sufficient work had been carried out on hematitic taconites, other types of taconites were tested. These ores contained, in addition to hematite, iron in the form of magnetite, siderite, and iron silicates. In one test with ore of this type, which contained 34 pct Fe, 7 pct ferrous iron and 2 pct CO_2, the mineral composition was as follows: Hematite, 69.5 pct; magnetite, 20.0 pct; siderite, 10.0 pct; iron silicates, 0.5 pct.

With this furnace feed, it was possible to operate the unit on a cyclic heat basis. The data obtained from magnetic separation tests on furnace products indicated that over 90 pct of the hematite and magnetite were present in the magnetic concentrates at all normal reduction temperatures. However, by regulating the reduction temperature, it was possible to place 75 pct of the siderite selectively in either the concentrate or the tailing. Under no conditions were the iron silicates converted to magnetic form.

The ability to convert the siderite to a magnetic end product as well is of considerable importance. In many cases, the siderite found in the taconite is so intimately locked with silica that it is not liberated at a practicable grind. When siderite of this nature is encountered, it is desirable to direct it to the tailings rather than produce a concentrate with a low iron assay. If relatively pure siderite is encountered, it would be desirable to direct it into the concentrates. The high silica concentrates produced from iron silicates are likewise best sent to waste with the tailings to avoid low grade concentrates.

The general conclusion may be drawn from this test work that, if the ore contains sufficient iron in the form of hematite to furnish the necessary heat for cyclic operation, the reduction oxidation process can be carried out on ores containing natural magnetite, siderite, or iron silicates.

NEW BOOKS

"Design of Machine Elements," by M. F. Spotts. Second Edition. The successful first edition has been developed to include new or additional material. Included are data on standard-size spring wire and equations for the design of rubber springs. The chapter on working stresses has been expanded to include methods for both static and fluctuating loads when acting on ductile or brittle materials. Prentice Hall, Inc., 70 Fifth Ave., New York 11. $9.65. 504 p.

"Effects of Taxation: Investments by Individuals," by J. K. Butters, L. E. Thompson, and L. Bollinger. Emphasis is given to effects of taxes on investments in common stock and other risk capital. Div. of Research, Harvard Business School, Soldiers Field, Boston 63. $6.25. 531 p.

"Boron Steel." A summary of much published material on boron steel. Widely documents the need, the many industrial applications which have been made, the effect of boron on steel. Included is a supplement on hardenability test, the H-steels, and their use. American Society for Metals, 7301 Euclid Ave., Cleveland 3. $1.00. 114 p.

"Symposium On Testing Metal Powders and Metal Powder Products." With the growing interest in powder metallurgy and manufacture of powder metal parts, have come demands for exacting methods of testing both parts and powder. Contains both papers and discussion of the Symposium held in Cleveland last year. American Society for Testing Materials, 1916 Race St., Philadelphia. $2.00. 96 p.

"ASTM Manual On Industrial Water." The combined efforts of ASTM Committee D-19, its associates and other members of the Society have produced this reference manual on industrial water. Of value to plant managers, executives, designers and technologists, it provides much reference data on a vital raw material and processing component. Sampling, analysis, identification and analysis of water-formed deposits are among subjects covered. American Society for Testing Materials, 1916 Race St., Philadelphia 3. $4.25. 344 p.

"Atomic Energy In Industry." Minutes of the special conference held in New York last October under auspices of the National Industrial Conference Board, Inc. An expression by many experts of industry's present and future roles in application of atomic energy. National Industrial Conference Board, Inc., 247 Park Ave., New York 17. $10.00.

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Technical Briefs

Engineering

RADIO CONTROL:

Switches, signals on Orinoco R.R. will be remote controlled.

Microwave channels similar to those used for television will soon be operating remote control switches, signals and interlocks on the 90 mile railroad of the Orinoco Mining Co., in Venezuela.

Application of the remote radio control will reduce problems in transporting iron ore from the U. S. Steel subsidiary's mine to Puerto Ordaz, terminal point at the Orinoco and Caroni Rivers.

400 Million Ton Reserve

Engineers of Union Switch & Signal Div. of Westinghouse Air Brake Co., Radio Corp. of America, Western Union and Pennsylvania R.R. cooperated in development of the remote control system.

Discovered in 1947, Cerro Bolivar contains an estimated 400 million tons of iron ore reserves. Its development will supplement domestic supplies of iron ore in the United States and elsewhere. Shipments of ore are expected to start early in 1954.

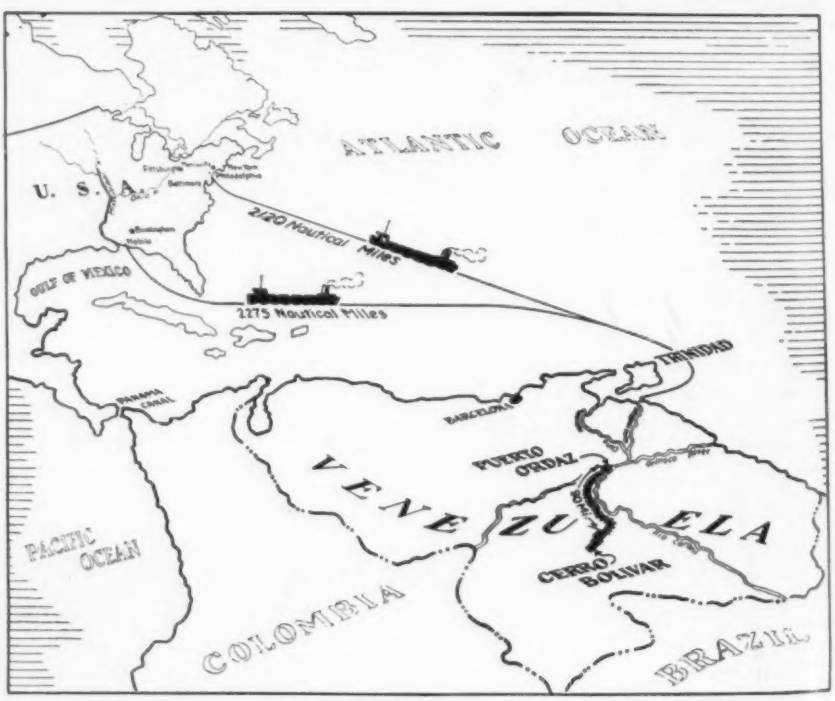
IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 103. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Through the use of very high frequency (VHF) radio waves, it will be possible to control two-way traffic on the single-track railroad from a central point at Puerto Ordaz. The railroad will have four sidings, two of which will be directly governed by VHF waves transmitted from the Puerto Ordaz tower.

Handles Telephones Too

The two sidings nearest the mine will be controlled by waves sent over a microwave trunk channel to a tower near the mine. At the tower, they will be demodulated and sent to tower locations at the sidings. There will also be four "set-off" sidings which will not be electronically controlled.



ORE FROM RICH Cerro Bolivar iron mines will move over a 90-mile radio-controlled railroad, then via river and ocean to U. S.

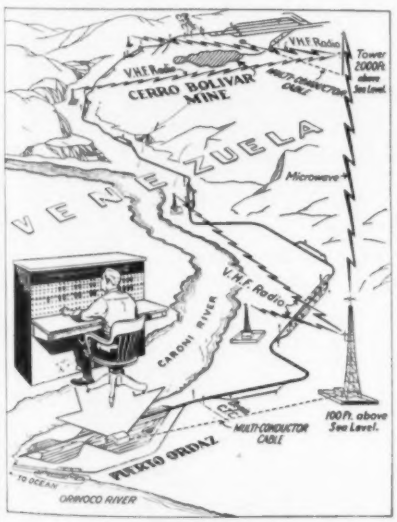
In addition to controlling two-way traffic on the single-track railroad, the system will be equipped to handle five telephone and two teletype channels over one full-duplex microwave circuit.

The project will call for installation of radio towers capable of carrying the microwave channel and transmitting and receiving VHF-FM at both Cerro Bolivar and Puerto Ordaz. Each of the two locations will be equipped with two transmitters, two receivers, two transmitting aerials and two receiving aerials, all supplied by RCA.

Steep Rise from Water

Because of the terrain, which rises from an altitude of 100 ft above sea level at Puerto Ordaz to more than 2000 ft at Cerro Bolivar, the tower at the former location will necessarily be of a greater height in order to achieve "eye-level" transmission and reception. There will also be transmitting and receiving towers at each of four sidings along the right-of-way.

Each siding and the five-track yard at the mine will be equipped with standard signals and switch machines. Each siding will also



AT PUERTO ORDAZ operator can control switches, signals and interlocks on mine railway. Six towers equipped with transmitters and receivers will make up the unusual control system. Only hand equipment will be switches and signals at four set-off sidings.

Turn Page

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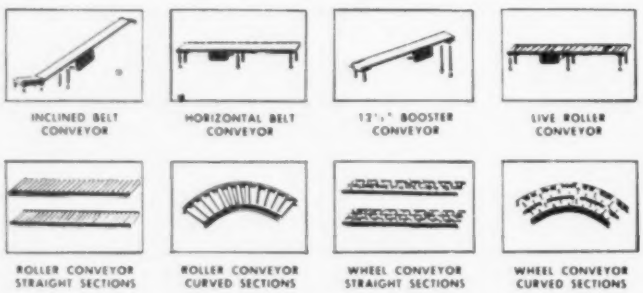

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have a centralized traffic control line coding unit for switch and signal control and an extension unit to handle indications of power failure and transfer from normal to standby carrier equipment.

Send Code Over Rails

Safety features of the signals governing moves over the right-of-way will be achieved through use of a coded track circuit system which uses the rails for code transmission. Holding signals will be placed at Puerto Ordaz and Cerro Bolivar.

At Puerto Ordaz, the controlling point for traffic movement, coded carrier control equipment, standby carrier equipment and a centralized traffic control panel will be installed.

Safety Features Built In

Under normal conditions, with a train leaving Cerro Bolivar and one leaving Puerto Ordaz over the same single-track right-of-way, an operator at the control panel will merely have to flick certain levers to insure safe passage for both trains. First, the panel will transmit coded pulses to release the signal holding the train at Puerto Ordaz. Microwave-channel transmission will be used to release the holding signal at the mine.

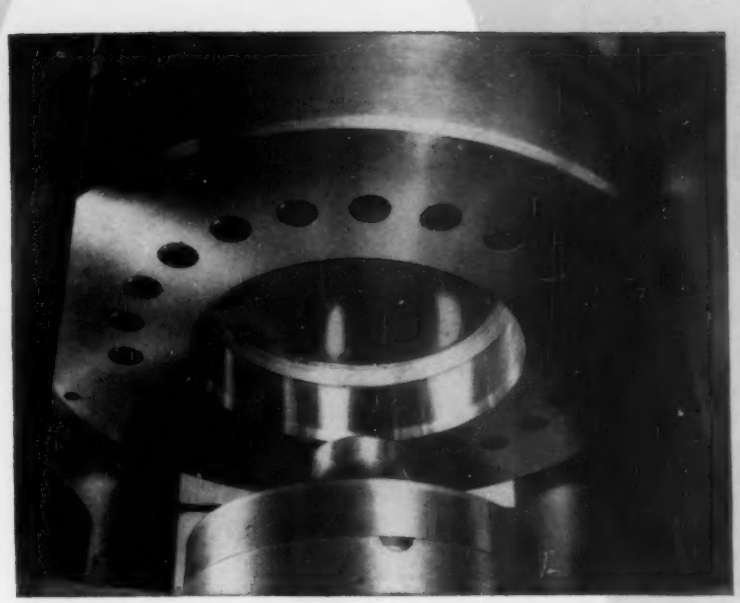
Eliminates Line Wires

To control the two sidings nearest Puerto Ordaz, the panel will transmit coded pulses over a three-mile cable to the radio tower location. These pulses will key a 2.9 kilocycle transmitter which, in turn, will modulate a transmitter. Receivers located at the sidings will pick up the code indications and operate the signals and switches accordingly.

With the Centralized Traffic Control system, movement of trains is directed by signals from a designated point without use of train orders or time table superiority of trains.

Elimination of the cost of constructing line wires and their associated maintenance was the principal reason for using the microwave-channel system.

Turn to Page 152



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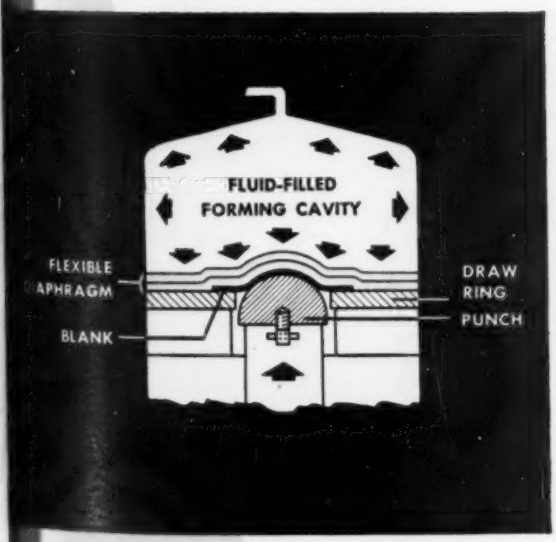

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—Technical Briefs—

STANDARDS:

Primary reference standard for water viscosity changed.

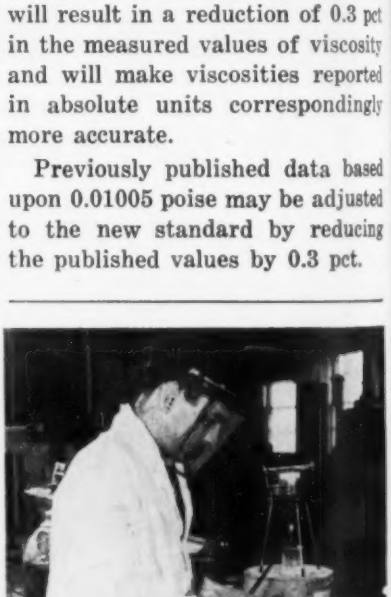
The absolute viscosity of water at 20°C has been set by the National Bureau of Standards at 0.01002 poise effective July 1. The value is used as a primary standard for the calibration of standard viscosity samples and viscometers.

The American Society for Testing Materials, the National Physical Laboratory in England and the Physikalisch-Technischen Bundesanstalt in Germany have indicated that they will also adopt the value of 0.01002 poise.

Adjustment Value

Up to the present, the value of 0.01005 poise for the absolute viscosity of water has been used widely as the primary reference standard. The use of the new value of 0.01002 will result in a reduction of 0.3 pct in the measured values of viscosity and will make viscosities reported in absolute units correspondingly more accurate.

Previously published data based upon 0.01005 poise may be adjusted to the new standard by reducing the published values by 0.3 pct.



FINELY POWDERED ceramic materials are flame-sprayed on steel at the testing laboratories, Ceramics Dept., Union Carbide Oak Ridge National Laboratory. Result: metals can stand up under much higher operating temperatures. With this protection, many metals can be used in nuclear reactors at above normal temperatures.

Turn Page

TUBE FORMING:

Internal hydraulic pressure, drop hammer cut production costs.

An unconventional method of forming odd-shaped, pressure-tight vent tubes on external fuel tanks, has cut production and material costs at Ryan Aeronautical Co., San Diego, Calif.

Made from 52SO aluminum alloy of 0.035 in. gage, the tubes are used to vent the fuel fumes from the wing tanks on Boeing B-47 Stratojet bombers.

Because of the limited space within this streamlined fairing the vent tube must be irregular in contour. Its shape is circular in cross-section in the mid-section and at both extremities. The other sections must be formed into elliptically-curved contours to squeeze into the available space. The carrying capacity of the tube must be maintained throughout its length and it must be smooth and gas-tight to perform its function.

Old Method Slow

These vent tubes were first formed from half-stampings and welded together. The weld beads were ground smooth at the tube ends so that attachment clips could be slipped on. While this method of fabrication produced a satisfactory tube it did not lend itself to the volume production.

On the first approach to the problem the Ryan production engineering division attempted to blow the tube into shape with the aid of accurately cast die blocks. A cap was welded on one end and hydraulic pressure was exerted within the tube.

Include Shrinkage Allowance

In practice, the seamless 2-in. tubing is cut to length, allowing 1 in. extra to compensate for shrinkage occurring when the sections are expanded in diameter. The tubing must be free from scratches or other defects. After cutting, the ends are burred and the tube is annealed to insure uniform results.

Next, a steel shaft, connected to a hydraulic pressure unit, is inserted in the tube. The shaft has piston-like fittings on both ends. Sealing is effected by means of "O" rings set in tandem grooves in these fittings.

Tube and shaft are placed in a steel die which is designed to allow the central portion of the tube to expand to a diameter of 2¼ in. Then the whole assembly is placed in a 250-ton hydraulic press. This press was selected because its ram may be brought down to close the die and hold it at the required 50 tons of pressure during the expansion cycle.

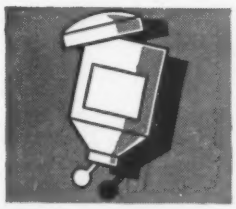
Use Drop Hammer

Hydraulic fluid is pumped into the steel shaft until a pressure of 900 to 950 psi is indicated. Flow direction is reversed, the die is opened and the expanded tube re-

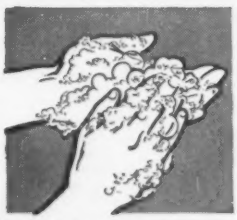
Turn Page

THREE REASONS

WHY SOME PEOPLE ARE PENNY-WISE AND POUND FOOLISH ON SOAP COSTS



1 defective dispensers



2 inefficient soap

3 slow acting soap

Defective or obsolete dispensers (wasting soap), inefficient soap (causing dryness, chapping, etc.) and slow sudsing soap (causing congestion in washrooms—you pay for the "lost time") are just three of many reasons why you may be throwing away hundreds of soap dollars in your plant washrooms.

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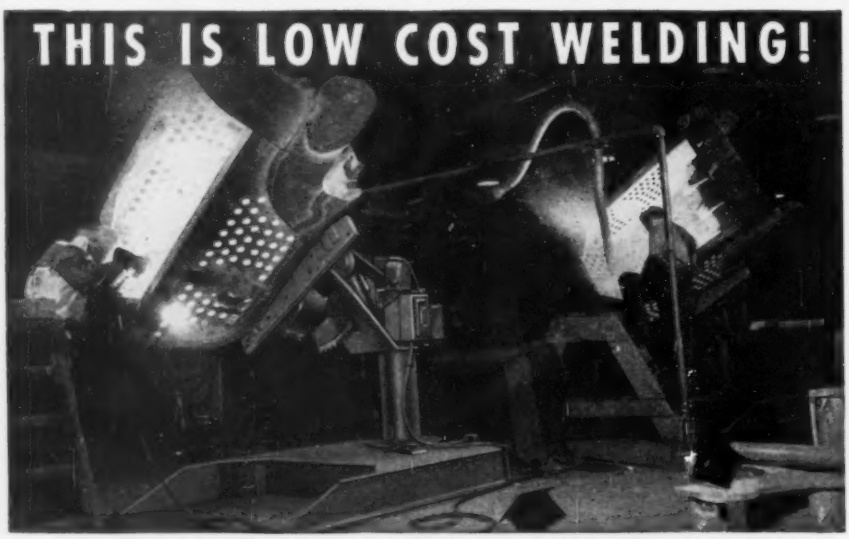

When a touch on a button moves weldments like these into the correct, most convenient position for a downhand pass, you get more arc time, more welding at lower cost. C-F power operated Positioners rotate the work in a full circle at any point in a range of 135° from the horizontal—giving welders a choice of an infinite number of downhand welding positions instantly.

Every requirement for faster, better positioned welding—constant or variable speed table rotation, full 135° tilt, self-locking gearing which holds the table in any position, oversize built-in main tilt and rotating bearings, choice of two base styles, and many other features—are built into C-F Positioners.

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C-F positioned welds mean better, more economical welds

moved. A petcock on the shaft permits excess fluid to be drained off before removing the shaft from the tube.

The expanded tube is now the proper size for forming into an elliptical shape having the same cross-sectional area as the original 2-in. diameter section. The elliptical forming is accomplished in a die and finisher die in the drop hammers.

Paraffin Prevents Wrinkling

To prevent wrinkling, the tube is filled with melted paraffin and allowed to stand in refrigerators until the paraffin has solidfied. The parts are then placed in the dies and struck by the drophammers. Under the impact, the paraffin exhibits the correct amount of resistance to prevent wrinkling or buckling of the metal and to permit the desired deformation. The tube sections emerge from the dies as smooth, tapered components of prescribed dimensions.

The new Ryan technique has permitted the volume production of these components and saved a substantial percentage of their cost. Including all tool costs, the method has resulted in a net saving of more than $15,000 per thousand tubes formed.

PLANT OPERATION:

FCC plans tighter regulation of electric equipment.

Owners of induction heating, dielectric sealing, and electric welding equipment face tighter regulation by the Federal Communications Commission.

When operating, many of these devices emit radio frequency energy upon frequencies which the FCC must keep clear of interference. This problem has become more and more acute, especially since the advent of television.

Mobile Patrol Used

As of June 30, the FCC has indicated it plans tighter control. Many offenders have already been located and patrolling mobile moni-

tors with direction finders are finding more all the time.

FCC regulations state quite broadly:

Sources of Interference

"The operation in the industrial, scientific and medical service, of medical diathermy equipment, industrial heating equipment and miscellaneous equipment of a type which emits radio frequency energy upon frequencies within the radio spectrum constitutes a serious source of interference to authorized radio communication services operating upon the channels of interstate and foreign communication unless precautions are taken which will prevent the creation of any substantial amount of such interference."

Dateline Set

A number of warnings and extensions have been given by the FCC. Some plants have continued operations in the hope that further extensions will be given. Recently, however, the FCC in Public Notice 85968 stated:

". . . Accordingly, all interested persons are advised that the commission has no present intention of adopting any further general extension of the terms for compliance with the applicable portions of Part 18 of the Rules beyond June 30th, 1953."

Proper Shielding Effective

Solution to the problem may in some cases require only a well-designed shielded space or room.

A low cost shielded enclosure specifically designed for this purpose has been developed by the Ace Engineering & Machine Co., Philadelphia. Made up of standard size panels framed in white pine with galvanized steel screening stretched across the outer surface, it may be easily erected, taken down, or enlarged.

Virtually any kind of electrical or mechanical power, water, gas, or other service can be brought into the enclosure. Tested by an independent laboratory, its attenuation is at least 40 db, even under the most adverse circumstances.

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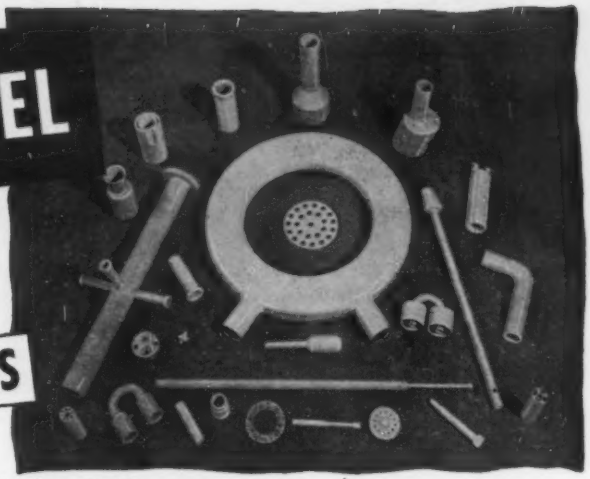

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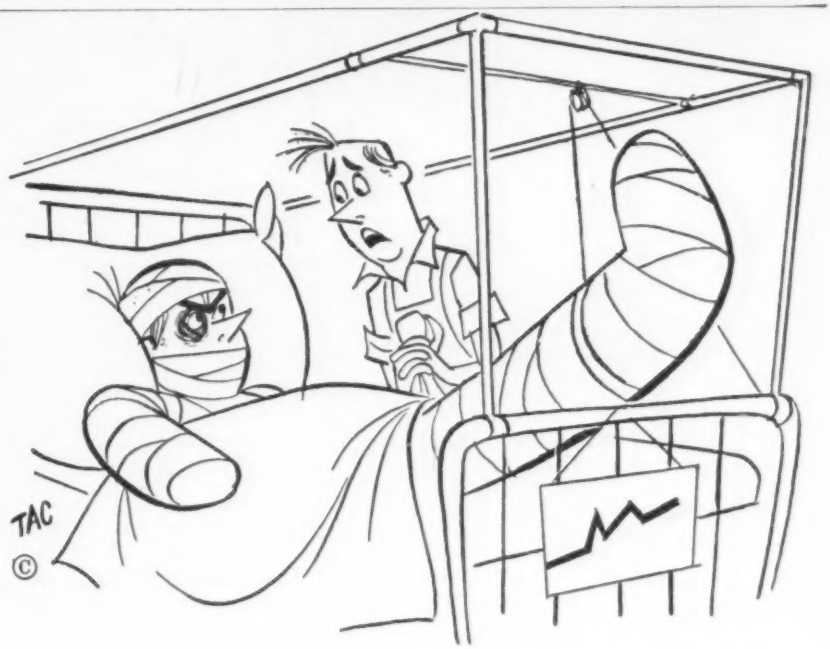

"Sorry I did it, Sam, but when you told me you forgot to re-order my OILDIE tool steel I guess I just lost my head."

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TACONITE:

Better blasting methods sought by Bureau of Mines.

More economical and efficient methods of blasting taconite—the hard iron-bearing rock which holds the key to the steel industry's future resources—have been sought by the U. S. Bureau of Mines in a recent blasting project.

The experiments, started in 1946, sought to determine the possible advantages of using shaped dynamite and other explosive charges to blast taconite. The Armed Forces found shaped charges effective in armor-piercing projectiles during World War II.

Shaped Charges Used

Research involved three steps. 1. Primary blasting of taconite using shaped charges in holes drilled into the rock. 2. Secondary blasting of taconite using shaped charges on top of rock fragments already broken by the initial blasting. 3. And primary blasting of taconite using conventional charges in horizontal, inclined and vertical holes drilled into the rock.

Charges were shaped into triangular, elongated cylindrical, and rectangular sizes. Shaped charges showed no advantage over conventional charges when used for blasting taconite from the ore face, the report states.

Delay Detonators Help

Conventional charges proved more effective for breaking up oversize blocks. Blasts for which the explosives were loaded in holes drilled in staggered, parallel rows broke the most ore, and firing the explosives with millisecond delay detonators instead of simultaneously made the broken ore easiest to remove.

Next Page

QUANTITY PRODUCTION OF GREY IRON CASTINGS

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—Technical Briefs—

Blasting studies were undertaken in an effort to provide information to bring down the cost of mining taconite which is high in part because of the difficulty of breaking taconite into pieces small enough to be handled by power shovels and ore-crushing mills. The ore tends to break into blocks resembling quarry-stone. Many of these are so large that they have to be further broken by secondary blasting.

See 5 Billion Ton Reserve

Reserves of magnetic taconite now being commercially developed in Minnesota have been estimated at about 5 billion tons from which about 1.7 billion tons of concentrates can be recovered. Taconite contains from 20 to 30 pct of iron, compared with more than 50 pct for the direct-shipping Lake Superior ores on which the U. S. steel industry principally relies.

Fired 168 Blasts

The experiments were conducted on a taconite deposit near Mesaba, Minn., and in the Bureau's experimental hard-rock mine at Mount Weather, Va. Bureau engineers fired 168 experimental blasts, using different kinds and quantities of explosives, different methods of firing, and different borehole patterns.

PLATING:

Zinc and iron deposited on steel give mirror surface.

Iron and zinc, deposited on steel electrolytically and at the same time, combine to give a hard, mirror-bright surface, research workers of the Dept. of Scientific Research, England, have found.

The coating, a combination of about 5 pct zinc and 95 pct iron, is very hard and adheres tightly to the steel. Most important of all, it has a "smoothing" action, in which the alloy is deposited first in the hollows of an uneven surface.

Plates Rapidly

This action may be particularly useful if the alloy coating can be developed as a substitute for nickel as an undercoating for chromium plate.

The speed with which the iron

Turn Page

Rolling with the Punches..

Drum segment assembly, 17½" dia. x 46" long—rough, sandy steel forging. Note the many interrupting cavities on the surface that give the tool its bumps.

On the jump cut job illustrated, a Kennametal clamped-tool is a 6 to 1 favorite over a HSS tool . . . takes thousands of bruising blows on its nose without breaking down; cuts miles of forged, sandy steel without wearing out.

Here are the comparative performances:

HSS tools took 12 hours to complete 2 cuts, and were reground 4 to 8 times. Kennametal tool Style BRH32, Grade K2S, operating at 6 times the speed, does the same work in 2 hours. Its clamped-on tip requires only 2 regrinds.

Great strength and ruggedness are required in a cutting tool, to enable a lathe to keep rolling on interrupted cutting. These qualities, inherent in Kennametal tools, are equally valuable for light, continuous cutting jobs. Ask our Field Engineers to demonstrate. Kennametal Inc., Latrobe, Pa.

KENNAMETAL

CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY

DESIGN IDEA CUTS PRODUCTION COST 50%

SIMPLE replacement of heavy cast covers with welded steel units effects an 80% reduction in weight on elevator machine covers at The Shepard Elevator Company, Cincinnati, Ohio. At the same time, manufacturing cost is 50% less. These direct savings result from less material and elimination of machining required on former castings.

Weight reduction is particularly important on this equipment since elevator machines are usually mounted on upper floors of multi-story buildings. Easier handling within the manufacturer's own plant as well as lower shipping charges further add to lowering total costs.

In manufacture, it was originally necessary to mill the bottom edge to form an oil-tight seal. This entire operation is now eliminated. The complete unit is manufactured within the shop and without dependence on outside sources for castings.

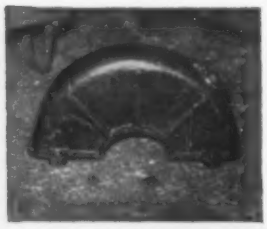

Fig. 1. Original construction of gear case cover weighed 66 pounds and required milling of bottom edge for oil-tight seal with gear case.

Fig. 2. Steel designed gear case cover now used weighs only 10 pounds and costs half as much to produce. Fabricated entirely within manufacturer's own shop by welding.

Fig. 3. Assembly of cover on gear case. Cover is 16 gauge sheet metal welded to plain angles forming oil-tight seal with main gear case.

How to Design in Welded Steel

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and zinc can be deposited, compared with nickel, would also be useful. Time taken to deposit 0.001 in. of alloy is 1 min, whereas it takes an hour to deposit the same thickness of nickel.

Alloy coatings with greater proportions of zinc resist corrosion better, but do not give such a bright finish. One with about one-third zinc to two-thirds iron has a silvery matt appearance and has a corrosion resistance comparable with that of an ordinary galvanized coating. Such a coating may well come into use for ordinary galvanized goods such as roofing sheets, wire and hollow ware.

TESTING:

Special machine slams car "door" hour after hour.

Industry builds all kinds of testing machines to bring the consumer a better and more durable product. One of the strangest of these machines is the "lock slammer."

Developed by Chrysler Corp. Div., and used in its Central Engineering Div.'s Structures Laboratory, the lock slammer does nothing but open and close car doors.

The three simulated car doors successively swing open and slam shut at the rate of 740 times an hour. To be acceptable, a lock must be capable of being slammed 50,000 times.

DOOR SLAMMER at Chrysler Engineering Laboratory tests locks for car doors day after day.

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Easier Steel Market Coming—But Not In Near Future

Scrap prices advance for 6th week in row . . . Healthy scrap usually means good business prospects for mills . . . Consumers inventories seen growing substantially.

Although steel producers are clearly gaining in their race with demand, vigorous boom is still the dominant factor in the market. As if to support that contention steel scrap prices continued their upward march with new increases in most areas. Steel scrap prices usually reflect market prospects of the mills.

THE IRON AGE Steel Scrap Composite Price advanced for the sixth consecutive week. New price is $43.50 per gross ton, an increase of $1.33 per ton. This composite price is based on average prices of No. 1 Heavy Smelting Steel at Pittsburgh Chicago, and Philadelphia. Prices advanced in all three of these areas this week.

Near High For Year . . . Recent increases have elevated the scrap composite price to within $0.75 a ton of the $44.25 per ton high for the year registered in March. High scrap prices then paced a month of record steel production (10,168,098 net tons) that may stand for a long time.

With backlogs of orders still averaging 4 to 5 months, steel production will stay as close to 100 pct of rated capacity as vacations, hot weather, and maintenance needs will permit. These physical limitations may keep operations a shade below the terrific first half pace, even though steel firms still have plenty of business.

Pressure Easing . . . But another reason for not pressing production equipment too hard is that consumer pressure is easing somewhat from frenzied levels existing before the wage settlement and price increases. Consumers still want plenty of steel, but they now seem willing and able to wait a reasonable time for delivery.

Steel inventories are definitely increasing. Defense manufacturers who have been cut back (aircraft producers are an example) have considerable amounts of some alloy steels on hand. A gear supplier strike (Borg-Warner) has slowed output of some auto companies and their suppliers. Result: Steel inventory is accumulating.

Inventories Grow Fast . . . One independent auto company reports steel "running out of its ears" after an auto production cutback attributed to this strike. This has not affected its mill buying, but it will enable the firm to stop buying premium priced steel sooner than would have otherwise been possible.

This company, which has been paying higher than mill prices for 45 pct of its steel since the first of the year, expects to have a reasonable working inventory—all from regular mill sources—by the end of the year.

Steel price increases have automatically raised the dollar volume of inventory. For financial or other reasons some manufacturers may decide to lower their targets on physical volume of inventory of steel and finished products made of steel.

Some Orders Cancelled . . . Steel sales people have noticed some order cancellations recently. But, so far, somebody else has been eager to pick up all tonnage that has become available for this reason. Cancellations are something the mills have seen very little of for some time. So they are viewed as harbingers of an easier market to come—even though freed material has been snapped up by other consumers.

Decision of some high cost steel producers not to raise prices may also ease pressure on other mills. As consumers find high cost producers pricing more competitively, they may ease their pressure on other suppliers.

Some Items Tighter . . . Despite signs of future easing in the steel market, some products are in tighter supply this week. Demand for galvanized sheets, for example, is strengthened by the grain bin storage program.

Government wants delivery of completed bins by October, and mills aren't going to have enough galvanized sheets available to finish them by that time. Result is that grain bin makers are calling on warehouses where galvanized sheets had been piling up in inventory.

Need Light Plates . . . Plate fabricators are still crying for steel. Within the past month supply has shifted: Heavier plates are in better supply and light plates are scarcer. Customers are pressuring one strip mill operator that had been turning out light plates to fill their orders.

Hot-topping facilities, which make quality steel for military and other uses, are still overtaxed. There seems no possibility of relief in the near future.

Shutdown Hurts . . . U. S. Steel is shipping slabs from Fairless Works to Pittsburgh in an effort to offset loss of steel due to shutdown of No. 3 openhearth shop at Homestead Works. This shutdown is hurting production of plates and structurals, and consumer pressure for these products is still very strong.

Steelmaking operations this week are scheduled at 96.5 pct of rated capacity, half a point lower than last week's revised rate. The operating rate is lower than in recent weeks because of vacations, maintenance needs, hot weather, and wildcat strikes.

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Market Briefs and Bulletins

Pig Iron Prices Upped . . . Across-the-board increases in pig iron prices have been made by a number of producers. The hike is $1.50 per gross ton. The companies are: U. S. Steel Corp. and subsidiaries, Interlake Iron Co., Pickands-Mather, Republic Steel Corp., Wickwire Spencer Steel Div., Tonawanda Iron Div. and Youngstown Sheet & Tube. Shenango Furnace Corp. raised its prices by the same amount effective July 1.

Stockpiling Will Continue . . . Government stockpiling of nickel, cobalt and other scarce commodities will continue indefinitely. John Houston, acting chairman of the Munitions Board, reports an "urgent need" for what he terms a "small handful of materials." "There should be no easy feeling that now we can relax," he told the House Armed Services Committee recently.

Drop Priorities Assistance . . . Orders M-46, 46-A, 46-B, and M-50, providing priorities assistance for the petroleum, gas, and electric utilities, have been revoked. However, Dirs. 1 of DMS Regs. 1 and 2 have been amended to make it possible for these industries to place ACM orders for nickel-bearing stainless from July 1 on. Specific authority must be obtained from the Dept. of Interior before industry can place priority orders.

Appliances Moving . . . Sales of Westinghouse Electric Corp.'s portable appliances during the first 5 months of this year were 30 pct ahead of last year's pace. Included in the company's line of portable appliances are electric housewares, fans, vacuum cleaners and electric bed coverings.

Sears' Prices Hold . . . Prices in Sears, Roebuck & Co.'s new fall-winter general catalog are just about the same as in the spring-summer and previous fall-winter catalogs. In comparing prices with those listed 1 year ago, the company says 44 pct of the items show no price change, 37 pct are up an average of 1 pct, and the remaining 19 pct are down slightly.

Clad Steel Upped . . . Lukens Steel Co. has increased the base price of its clad steels about 5 pct and raised the base price of all flanged products 10 pct. The company is holding to its previous announcement that it would not boost current carbon and alloy steel plate base prices.

Revise Differentials . . . A change in quantity differentials on hot-rolled materials was made recently by Joseph T. Ryerson & Son. Effect of the revision is to lift the differential slightly on orders below 1 ton and to lower it on hot-rolled orders exceeding this amount. At the same time grouping combinations were altered.

Britain Cuts Steel Export Prices . . . British export prices on certain heavy steel products such as joists and beams have been reduced by about $19.67 to a level of about $106.78 per long ton. In another move, the government decided to restore private trading in aluminum. Effective July 1, the Control of Aluminum Order was revoked and private imports of aluminum permitted.

Compute Copper Setasides . . . An amendment to M-11A provides a basis for new producers to compute their defense and military setasides of copper and controlled materials. If a specific item was not produced during the first 6 months of last year, the military setaside is to be calculated on the basis of the current month's production.

Raise Drum, Pail Prices . . . U. S. Steel Products Div., U. S. Steel Corp. last week increased prices of its steel drums and pails from 6½ to 8 pct.

Sign Labor Agreement . . . Midvale Co., Nicetown, Philadelphia, and Federal Labor Union Local No. 18887 (AFL) signed their 1953 Labor Relations Agreement last week. Agreement gives employees a wage and benefit increase amounting to approximately 11¢ per hr.

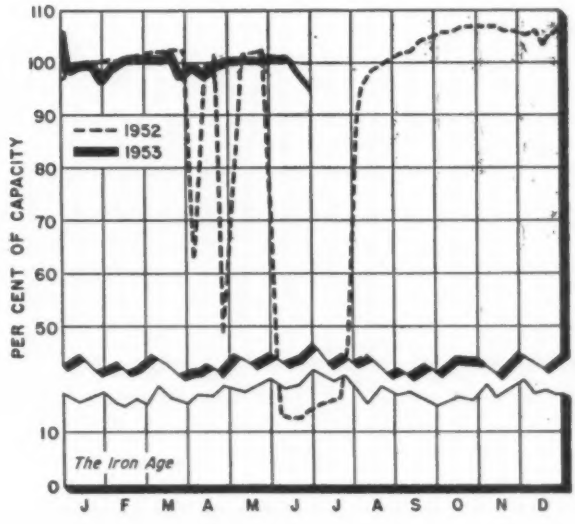
STEEL OPERATIONS

District Operating Rates

District	Week of June 28	Week of June 21
Pittsburgh	97.0	98.0*
Chicago	102.5	103.5*
Philadelphia	96.0	98.0
Valley	100.00	96.0*
West	100.0	105.5*
Cleveland	88.5	90.5*
Buffalo	106.5	106.5
Detroit	105.0	105.0
Birmingham (South)	99.5	101.0
Wheeling	100.0	100.0*
South Ohio River	89.5	90.0
St. Louis	107.6	106.5
East	86.5	85.5*
AGGREGATE	**96.5**	**97.0***

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



Chile Studies Copper Situation

Price cut may be in making . . . Production may be trimmed to bolster demand . . . Aluminum wage talks rescheduled . . . Mine, Mill calls strike vote—*By R. L. Hatschek.*

Indications from Santiago are that the Chilean government may be about to revise copper policies —at least do something about its prices. This has been expected for some time and the delay has been more surprising than the action will be if it comes.

While the red metal was in very tight supply the Chileans charged just about what the traffic would bear. They are still asking 35.50¢ per lb at Chilean ports but this copper is being ignored as much as possible by U. S. consumers as well as others.

Stocks Piling Up . . . And while customers stay away, copper and copper concentrates are piling up in Chilean ports. According to some estimates, the quantity of material piled up there now totals about 40,000 tons, a sizeable tonnage.

Felipe Herrara, the new Finance Minister of the South American country, said last week that production problems will be studied as well as price considerations. This means that Chile is at least thinking of cutting back output as a means of bolstering the weakening price.

U. S. Market Quiet . . . Coming vacation shutdowns are having their effect on the domestic copper market. Purchasing is reported definitely on the light side at the current market price of 29.75¢ to 30.0¢ per lb in anticipation of plant shutdowns.

Set Nickel Quota . . . Primary nickel available to the U. S. in the July-September quarter amounts to 25,078 metric tons, International Materials Conference announced this week.

This tonnage was among those agreed upon by member governments of IMC, which recommends allocations of free-world nickel production. The U. S. share represents two-thirds of the total of 36,315 tons proposed for distribution in the 3-month period.

Production Going Up . . . This total tonnage is slightly less than that for the April-June quarter, though IMC says production actually is expected to be higher in the next 3 months. The difference, the agency says, is that the "carry over" of tonnage into the quarter just completed was greater.

In addition to this country, 35 world areas get nickel under the recommended plan. Any metal allocated to but not taken up by participating countries will be available for purchase by consumers in the U. S. and elsewhere.

Delay Labor Talks . . . Negotiations between the United Steelworkers of America and Aluminum Co. of America were extremely brief last week. Both sides were only investigating possibilities at this point and no overtures were made by either party.

The talks were postponed and rescheduled for this Tuesday. At press time nothing startling had evolved.

Meanwhile, the AFL Aluminum Workers Council has made no moves at all, apparently waiting to see how well the CIO manages. Expectations are that both unions will seek terms very similar to those granted by steelmakers.

Call Strike Vote. . . . Elsewhere on the labor scene, many copper, lead and zinc labor contracts expired on June 30. Several conferences were scheduled for Tuesday with the Union of Mine, Mill and Smelter Workers. This union has called for a strike vote to be taken against the entire nonferrous metals industry. Members are to cast their ballots July 16 and 17.

Tin Slides . . . New low points since the start of war in Korea were established for tin at the three major world market centers of New York, London and Singapore. This Monday the New York quotation was down to 90.50¢ per lb for prompt tin.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in June, based on quotations appearing in THE IRON AGE were as follows:

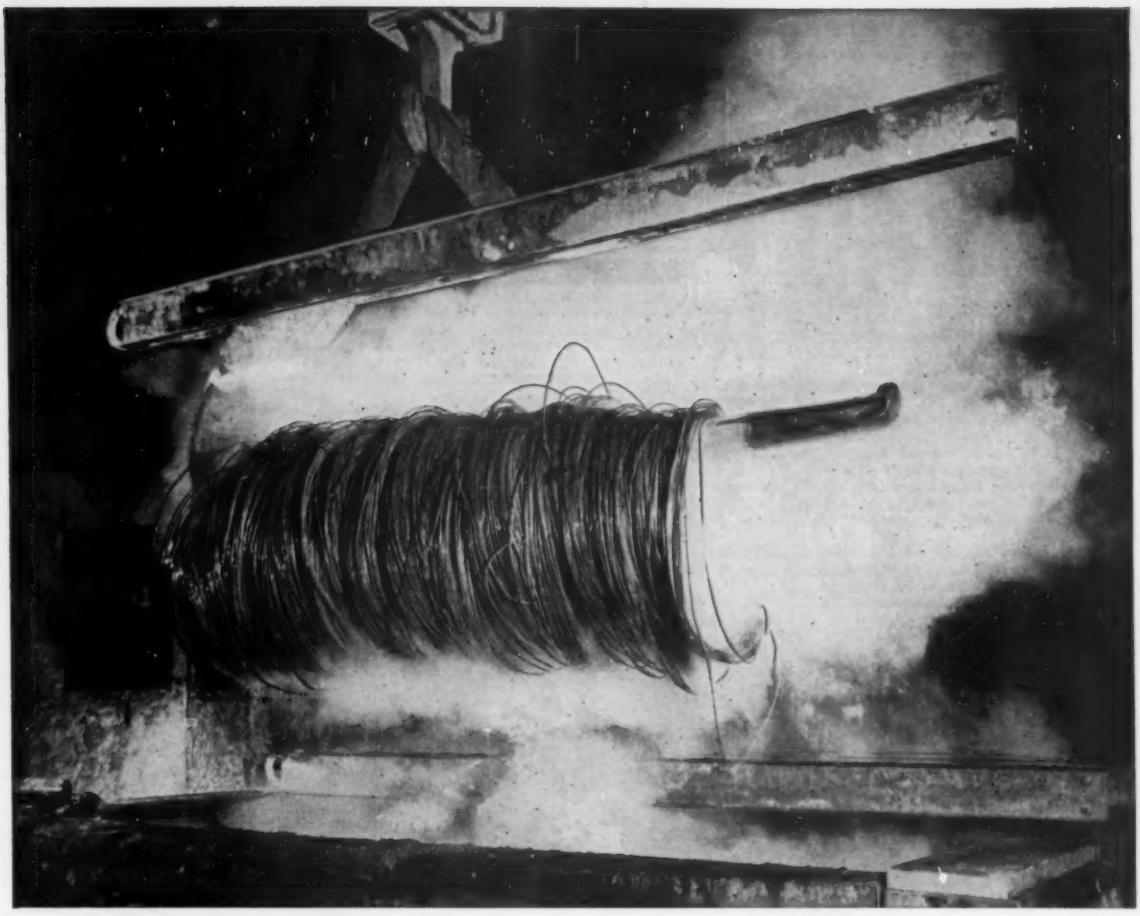
	Cents Per Pound
Electrolytic copper, Conn. Valley	29.875
Lake Copper, delivered	30.125
Straits tin, New York	92.915
Zinc, East St. Louis	11.000
Zinc, New York	11.829
Lead, St. Louis	13.213
Lead, New York	13.413

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	June 24	June 25	June 26	June 27	June 29	June 30
Copper, electro, Conn.	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00	29.75–30.00
Copper, Lake delivered	....	....	30.125	30.125	30.125	30.125
Tin, Straits, New York	93.00	91.75	91.25	....	90.50	90.50*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices.
*Tentative



Monel pickling hook used at the Pittsburgh Steel Co., Pittsburgh, Pa. Fabricated by Youngstown Welding and Engineering Co., Youngstown, Ohio.

Reconditioned after 7 years in use!

Monel pickling hooks after "minor surgery" and welding are ready for more years of service

Back in 1944, Pittsburgh Steel Co. installed Monel hairpin pickling hooks.

Monel® was selected after many tests with other materials that failed in less than a year.

Operating conditions were tough, pickling in 10% sulfuric acid at 180°, carrying a load of 3,000 pounds.

But Pittsburgh Steel felt that Monel could take it.

And they were right!

After *seven* years in use, the hooks showed signs of weakening only at the acid line.

And the fabricators, Youngstown Welding & Engineering Co., remedied that!

They cut out the corroded section and welded in new Monel.

Now, Youngstown feels that the hooks are almost as good as new and will give many more years of service.

This is a typical example of how fabricated Monel pickling equipment can give long service life—then be reconditioned with a small amount of material to give additionally long service.

Tough, corrosion-resistant Monel equipment can help you increase the efficiency of your own pickling room, too. Monel crates, racks, chains, hooks, and accessories are used by many of the nation's leading plants to give increased payloads and longer service life.

It is advisable to place equipment orders with your supplier well in advance of scheduled use. Distributors of Inco Nickel Alloys can supply the latest information on availability from warehouse and mill.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N.Y.

INCO TRADE MARK **MONEL**... for minimum maintenance

Nonferrous Prices

(Effective June 30, 1953)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188-in., 2S, 3S, 32.9¢; 4S, 61S-O, 34.9¢; 52S, 37.2¢; 24S-O, 24S-OAL, 35.9¢; 75S-O, 75S-OAL, 43.6¢. 0.081-in., 2S, 3S, 34.1¢; 4S, 61S-O, 36.6¢; 52S, 38.9¢; 24S-O, 24S-OAL, 37.2¢; 75S-O, 75S-OAL, 45.7¢. 0.032-in., 2S, 3S, 35.9¢; 4S, 61S-O, 40.6¢; 52S, 43.5¢; 24S-O, 24S-OAL, 45.6¢; 75S-O, 75S-OAL, 57.0¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 30.9¢; 4S-F, 33.0¢; 52S-F, 34.7¢; 61S-O, 33.6¢; 24S-O, 24S-OAL, 35.4¢; 75S-O, 75S-OAL, 42.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.4¢ to 80.3¢; 12 to 14, 37.1¢ to 97.2¢; 24 to 26, 39.7¢ to $1.27; 36 to 38, 47.0¢ to $1.86.

Rod, Rolled: 1.064-in. to 4.5-in., 2S-F, 3S-F, 41.0¢ to 86.6¢; cold-finished, 0.375-in. to 3.499-in., 2S-F, 3S-F, 44.2¢ to 38.3¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32-in., 58.4¢ to 45.9¢; ⅜ to 1½-in., 45.3¢ to 42.6¢; 1 9/16 to 3-in., 42.0¢ to 39.3¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 43.2¢ to 31.7¢; 52S, 52.4¢ to 38.3¢; 17S-T4, 59.0¢ to 41.0¢; 61S-T4, 52.9¢ to 40.5¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in., 40.5¢ to 59.0¢; 2 to 4 in., 36.6¢ to 49.7¢; 4 to 6 in., 37.1¢ to 45.3¢; 6 to 9 in., 37.6¢ to 47.5¢.

Roofing Sheet: Flat, per sheet, 0.019-in., 28 x 72 in., $1.247; x 96 in., $1.662; x 120 in., $2.077; x 144 in., $2.494. Coiled sheet, per lb, 0.019 in. x 28 in., 30.8¢; 0.024 in. x 28 in., 29.3¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ⅛ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $8; Forgings, $6.

Nickel Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks		57	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51		50.58
Copper, h-r	50.48	46.83	
Copper, drawn		48.08	
Low brass	45.99	45.68	
Yellow brass	42.87	42.56	
Red brass	47.11	46.80	
Naval brass	47.01	41.07	42.33
Leaded brass			39.95
Com. bronze	48.76	48.45	
Mang. bronze	50.73	44.62	46.18
Phos. bronze	70.50	70.75	
Muntz metal	44.91	40.47	41.72
Ni silver, 10 pct	56.56	59.83	62.89

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	20.50
Aluminum pig	19.50
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismouth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	29.50 to 30.00
Copper, Lake, delivered	30.125
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.30
Lead, New York	13.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$190 to $193
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$93
Silver, New York, cents per oz.	85.25
Tin, New York	90.50
Titanium, sponge	$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	26.00
No. 120	25.00
No. 123	24.00
80-10-10 ingot	
No. 305	30.00
No. 315	28.00
88-10-2 ingot	
No. 210	38.25
No. 215	34.75
No. 245	30.25
Yellow ingot	
No. 405	21.25
Manganese bronze	
No. 421	26.50

Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	25.25
0.60 copper, max.	24.75-25.00
Piston alloys (No. 122 type)	23.00-23.75
No. 12 alum. (No. 2 grade)	22.50-23.25
108 alloy	22.75-23.50
195 alloy	22.75
13 alloy (0.60 copper max.)	24.75-25.00
ASX-679	22.75-23.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	23.75-24.50
Grade 2—92-95%	23.00-23.75
Grade 3—90-92%	22.00-22.50
Grade 4—85-90%	21.00-21.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over.)

	Heavy	Turnings
Copper	28⅝	27⅞
Yellow brass	21⅝	19⅝
Red brass	25⅛	24⅛
Comm. bronze	26⅛	25⅛
Mang. bronze	20	19¼
Brass rod ends	19¾	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	23½
No. 2 copper wire	22
Light copper	20½
*Refinery brass	19½—20

* Dry copper content.

Ingot Makers' Scrap

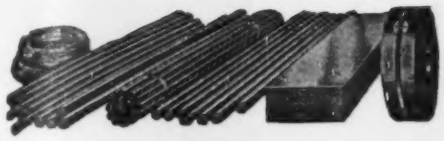
(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	23½
No. 2 copper wire	22
Light copper	20½
No. 1 composition	18 —18½
No. 1 comp. turnings	17½—18
Rolled brass	14 —14½
Brass pipe	14 —14½
Radiators	14 —14½
Aluminum	
Mixed old cast	13½—14
Mixed new clips	15½—16
Mixed turnings, dry	13½—14½
Pots and pans	13½—14

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	23
No. 2 heavy copper and wire	20
Light copper	18
New type shell cuttings	18
Auto radiators (unsweated)	13
No. 1 composition	16½—17
No. 1 composition turnings	16 —16½
Unlined red car boxes	15 —16
Cocks and faucets	15
Mixed heavy yellow brass	11½
Old rolled brass	14
Brass pipe	16
New soft brass clippings	16½—17½
Brass rod ends	16 —16½
No. 1 brass rod turnings	15 —16
Aluminum	
Alum. pistons and struts	7 — 7½
Aluminum crankcases	10
2S aluminum clippings	14
Old sheet and utensils	10
Borings and turnings	7½
Misc. cast aluminum	10
Dural clips (24S)	10
Zinc	
New zinc clippings	5½
Old zinc	4½
Zinc routings	3½
Old die cast scrap	3½
Nickel and Monel	
Pure nickel clippings	100
Clean nickel turnings	85
Nickel anodes	100
Nickel rod ends	100
New Monel clippings	33 —35
Clean Monel turnings	25
Old sheet Monel	30 —32
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12
Lead	
Soft scrap, lead	10½—11
Battery plates (dry)	6 — 6½
Batteries, acid free	4.40— 4.50
Magnesium	
Segregated solids	15 —16
Castings	14 —15
Miscellaneous	
Block tin	80
No. 1 pewter	55
No. 1 auto babbitt	45
Mixed common babbitt	12 —12½
Solder joints	16¼—16½
Siphon tops	45
Small foundry type	16
Monotype	14
Lino. and stereotype	12¾
Electrotype	11
Hand picked type shells	8½
Lino. and stereo. dross	6
Electro dross	4½



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport Brass Co. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

A variety of automatic screw machine parts which illustrate forming, drilling, threading, knurling, and milling. Courtesy Seymour Brass Turnings Company, Seymour, Connecticut.

Achieving Higher Productivity

Yet Maintaining Accuracy and Good Finish

Higher productivity is the goal of screw machine operators to offset as much as possible rising labor and material costs.

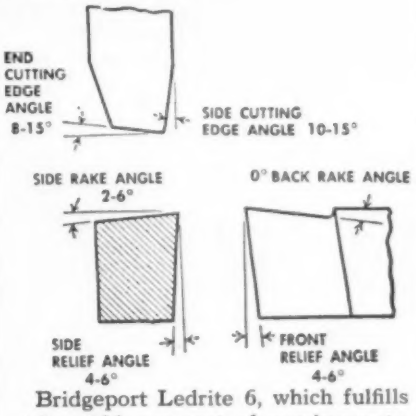
It is recognized that ancient, worn-out equipment in crowded quarters result in high cost, poor working conditions and low productivity. To attain higher productivity, the following factors should be considered:

1. Up-to-date machines — fast and sturdy.
2. Well-designed tools that perform with maximum efficiency and tool life.
3. Fast-cutting brass rod—accurate in dimensions and uniform in quality.
4. Proper coolant-lubricants.
5. Well-arranged layout in a good building.

Turning

On copper alloys the larger portion of forming operations are performed by circular, dovetail or flat tools. Turning and drilling or reaming can be done simultaneously. On exceedingly close tolerance work, drilling can sometimes cause variations in the size of the part. However, in other cases, drilling will tend to support the work.

Tools for cutting metal with a machinability rating between 70 and 100 per cent, require very little rake, as illustrated below.


END CUTTING EDGE ANGLE 8-15°
SIDE CUTTING EDGE ANGLE 10-15°
SIDE RAKE ANGLE 2-6°
0° BACK RAKE ANGLE
SIDE RELIEF ANGLE 4-6°
FRONT RELIEF ANGLE 4-6°

Bridgeport Ledrite 6, which fulfills at least 90 per cent of requirements, has a 100 per cent machinability rating. It contains 61% copper, 3.4% lead, remainder zinc.

Ledrite 2 Medium Leaded, machinability rating of 90 per cent (65% copper, 1.8% lead, remainder zinc) was developed for excellent machinability plus cold working as required for roll threading, knurling, forming and expanding.

Accuracy

Accuracy is maintained by elimination of mechanical faults, and in many cases its loss can be attributed directly to too much heat generated through friction. Sharp tools of proper hardness are imperative in attempting to hold accurate sizes. However, the removal of chips is an important factor. If the tool is not cutting cleanly, the increased pressure between the work and the tool forces the work away from the tool and at the same time thrusts the carriage back. This condition normally accounts for oversize parts.

Undersized dimensions are generally caused by excessive heat. Vibration in thin, long work pieces or in the tool or machine itself, will lead to variation in dimensions. Lighter cuts will generally reduce this vibration. Rigidity of the brass rod permits better shape and accuracy in the finished part, in other words, better quality control.

Finish

A good finish should be obtained with the first cut if possible, eliminating two operations, viz., roughing and finishing cuts. Finish is affected by practically every condition encountered in machining. Dull tools are the most common cause of poor finish.

Better finishes, in many cases, can be obtained through carefully ground and polished cutting surfaces, the use of higher surface speeds and slower feeds. Minimum rake angles apply to free turning brass rod. However, the condition of the machine—play in the spindle, rigidity in the tool posts and ways—and the type of lubricant affect the finish considerably.

When the front clearance is too small, the burnished or bumpy surface and increased heat through friction instantly reveal the source of trouble. If the finish cut is heavy, high rake and clearance angles cause hogging in and chattering by permitting the tool to vibrate, even though slightly.

Write for Bridgeport's "Technical Handbook" for the physical and mechanical properties of standard rod alloys and other mill products. Please contact the nearest Bridgeport sales office for your metal requirements.

(9958)

Scrap's Strength Shows in Price Hikes

Pittsburgh's No. 1 climbs $2 a ton on sale . . . Chicago range narrows . . . Other scrap centers have price boosts . . . No. 2 bundles leap in Cincinnati . . . Start fair trade drive.

Strength has been building up in the scrap iron and steel market quietly in past weeks. Last week Pittsburgh prices rose on an appraisal basis. This week a sale confirmed price strength in that area as No. 1 heavy melting steel rose $2 per ton to a top of $46.

The range of Chicago heavy melting narrowed to $40 to $41 in favor of the strong side. In Philadelphia steelmaking grades rose $1 to $2 per ton while in New York No. 1 heavy rose by $1 but secondary grades held firm at last week's price levels. Both cities registered gains in low phos grades to allow for a preparation charge spread.

Detroit traders were waiting results of bidding on automotive scrap lists to establish the market. Meanwhile turnings rallied. On the basis of a sale Cleveland steelmaking grades climbed $2. In Cincinnati No. 1 heavy and No. 2 jumped $3 per ton and No. 2 bundles surged ahead by $4 a ton as July buying opened up.

With the exception of sagging West Coast markets, scrap trading generally held an optimistic tone. Dealer inventories remain slim while consumer stocks are reported being pared down by heavy operations.

Institute of Scrap Iron & Steel last week embarked on a fair trade practices program as a means of protecting the position of the industry and improving the quality of scrap. The Institute held that removal of dirt and foreign substances from No. 2 bundles is imperative.

Pittsburgh—On basis of a sale, No. 1 heavy melting steel jumped $2 per ton to a top of $46 this week. Other openhearth grades were up corresponding amounts. The market is strong here despite lack of interest by the largest consumer. Latest price is $1 higher than that paid just last week by an independent mill. Blast furnace grades and railroad scrap also were strong. Cast is showing tentative strength.

Chicago—Range of No. 1 heavy melting narrowed to $40 to $41. Though asking prices on turnings still held, a few sources were reported ready to drop their prices somewhat. Generally, the market was firm—either up, or holding well. There had been some broker buying of turnings at $27 last week and prices of well over $30 were reported on shell quality turnings, though these two prices did not represent the market generally.

Philadelphia — Steelmaking grades showed further strength this week, going up $1 to $2 per gross ton. Despite vacation shutdowns at electric furnace plants, low phos grades are quoted higher this week in sympathy with the boosts in openhearth material. Cast grades remained unchanged with a good sized sale of charging box cast confirming current prices.

New York—Although out of the area prices are still too low to permit shipping, an inquiry from the West was reported this week. Meanwhile prices of No. 1 heavy melting and Low Phos, 2 ft and under, moved up $1. Turnings appeared to be a shade stronger. Cast grades continued to sleep as foundry vacations approached. Old prices held although little was moving. Shipping rate was about same on all scrap.

Detroit—Dealer scrap is at a near standstill at the moment as mills await results of bidding on automotive lists. The market is expected to be established when purchasers evaluate their list scrap and determine what will be needed from the open market. Some surprising strength developed in turnings, bringing prices up $1. No. 2 bundles and heavy melting also picked up on the basis of local sales and offerings from the Valley.

Cleveland — Steelmaking grades went up $2 on the basis of a sale in the area. High list bidding also lent added strength to the market. Scrap men here believe prices will level off in the $44-$45 range. Rails followed the bullish trend as 18 in. crops jumped $2 to $56. No. 1 machinery cast and stove plate both went up $1 to $50 and $45 respectively.

Birmingham—Scrap movement is slow with many orders received earlier in the month not yet filled. Dealers say only a trickle of scrap is coming into the yards. Some are able to supply no more than a carload or two. Others are refusing to ship at all, hoping that prices will advance. Brokers, however, are divided in their opinions. Some expect prices to rise shortly, while others expect little change before fall. The cast market is dull, with only small orders being received.

Cincinnati—As predicted last week July buying resulted in higher prices. No. 1 heavy melting rose $3 to $43 while No. 2 steel went from $36 to $39. No. 2 bundles registered the biggest gain on the openhearth list as buyers paid an extra $4 at $37 delivered. Increased demand for openhearth turnings sent blast furnace grades up from $2 to $6.

Boston—New England scrap market showed a few more signs of activity in the past week with prices going up on all openhearth grades except No. 1 heavy melting. Borings and turnings showed a slight strengthening as did stove plate. Good quality material is still in demand.

Buffalo—Market is holding steady as a leading mill consumer renewed orders for July delivery within prevailing price ranges. Another top mill is expected to do the same. Despite good weather supplies are only fair. Cast market remains weak.

West Coast—Last week's scrap export embargo by the State Dept. did little to encourage western dealers actively campaigning for licenses. The few who have accumulated large stockpiles are expected to hang on due to heavy investment. Early indications were for unchanged mill buying prices during July.

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Scrap Prices

(Effective June 30, 1953)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	39.00 to 40.00
Machine shop turn	26.00 to 27.00
Mixer bor. and ms. turns.	26.00 to 27.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. punch'gs, plate	48.00 to 49.00
Heacy turnings	41.00 to 42.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	49.00 to 50.00
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	51.50 to 52.50
RR. spring steel	51.50 to 52.50
RR. couplers and knuckles	51.50 to 52.50
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00
Malleable	48.00 to 49.00

Chicago

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 factory bundles	42.00 to 43.00
No. 1 dealers' bundles	41.00 to 42.00
No. 2 dealers' bundles	35.00 to 36.00
Machine shop turn.	22.00 to 24.00
Mixed bor. and turn.	24.00 to 26.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 26.00
Low phos. forge crops	47.00 to 49.00
Low phos. punch'gs, plate	44.00 to 45.00
Low phos. 3 ft and under	43.00 to 44.00
No. 1 RR. hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	47.00 to 48.00
Rerolling rails	51.00 to 53.00
Rails 2 ft and under	52.00 to 53.00
Locomotive tires, cut	47.00 to 48.00
Cut bolsters & side frames	46.00 to 47.00
Angles and splice bars	48.00 to 50.00
RR. steel car axles	53.00 to 54.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Cast iron car wheels	41.00 to 43.00
Malleable	41.00 to 43.00
Stove plate	34.00 to 35.00

Philadelphia Area

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	33.50 to 34.50
Machine shop turn.	26.50 to 27.50
Mixed bor., short turn.	30.00 to 31.00
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings.	38.50 to 39.00
Low phos. 5 ft and under	44.00 to 45.00
Low phos. 2 ft and under	46.00 to 47.00
Low phos. punchings	46.00 to 47.00
Elec. furnace bundles	45.00 to 46.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	55.00 to 56.00
Cupola cast	37.00 to 38.00
Heavy breakable cast.	41.00 to 42.00
Cast iron carwheels	46.00 to 47.00
Malleable	46.00 to 47.00
Unstripped motor blocks.	27.00 to 28.00
No. 1 machinery cast.	45.00 to 46.00
Charging box cast.	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. 2 ft and under	46.00 to 47.00
Drop forge flashings	41.00 to 42.00
No. 1 RR. hvy. melting	47.00 to 48.00
Rails 3 ft and under	53.00 to 54.00
Rails 18 in. and under	55.00 to 56.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	44.00 to 45.00
Malleable	48.00 to 49.00

Youngstown

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. plate	47.00 to 48.00

Buffalo

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	38.00 to 38.50
No. 1 busheling	40.00 to 40.50
No. 1 bundles	40.50 to 41.50
No. 2 bundles	36.00 to 36.50
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	29.00 to 29.50
Shoveling turnings	30.00 to 30.50
Cast iron borings	29.00 to 29.50
Low phos. plate	44.00 to 45.00
Scrap rails, random lgth.	45.75 to 46.75
Rails 2 ft and under	51.75 to 52.75
RR. steel wheels	50.50 to 51.50
RR. spring steel	50.75 to 51.75
RR. couplers and knuckles	50.50 to 51.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles, openhearth	37.00 to 38.00
No. 2 bundles	30.00 to 31.00
New busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Electric furnace, bundles	37.00 to 38.00
Low phos. punch'gs, plate	37.00 to 38.00
No. 1 cupola cast	44.00
Heavy breakable cast.	36.00
Stove plate	36.00
Automotive cast.	44.00

St. Louis

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundled sheets	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	17.00 to 19.00
Cast iron borings	11.00 to 13.00
Rails, random lengths	46.00 to 48.00
Rails 18 in. and under	51.00 to 53.00
Locomotive tires, uncut	43.00 to 44.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	53.00 to 54.00
RR. spring steel	43.00 to 44.00
Cupola cast.	40.00 to 41.00
Hvy. breakable cast.	33.00 to 35.00
Cast iron brake shoes	39.00 to 40.00
Stove plate	34.00 to 35.00
Cast iron car wheels	43.00 to 44.00
Malleable	35.00 to 36.00
Unstripped motor blocks	33.00 to 34.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 bundles	27.00 to 28.00
Low phos. 2 ft and less	38.00 to 39.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	29.00 to 30.00
No. 1 machinery cast.	42.00 to 43.00
Mixed yard cast.	33.00 to 34.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks.	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	33.00 to 34.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	20.75 to 21.75
Shoveling turnings	22.75 to 23.75
Cast iron borings	22.75 to 23.75
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR. hvy, melting	35.00 to 36.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	45.00 to 46.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	45.00 to 46.00
Std. steel axles	45.00 to 46.00
No. 1 cupola cast	39.00 to 40.00
Stove plate	35.00 to 36.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks.	32.00 to 33.00
Mashed tin cans	17.00 to 18.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.25
No. 2 hvy. melting	$28.00 to 29.00
No. 1 bundles	32.50 to 33.00
No. 2 bundles	26.50 to 27.00
No. 1 busheling	32.50 to 33.00
Elec. furnace, 3 ft & under	33.25
Machine shop turn.	17.00
Mixer bor. and short turn.	21.00
Shoveling turnings	21.00
Clean cast chem. borings.	28.17
No. 1 machinery cast	30.00 to 31.00
Mixed cupola cast.	26.00 to 28.00
Heavy breakable cast.	26.00 to 28.00
Stove plate	27.00
Unstripped motor blocks.	22.00

Cincinnati

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	25.00 to 26.00
Low phos. 18 in. & under	46.00 to 47.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	52.00 to 53.00
No. 1 cupola cast.	41.00 to 42.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	48.00 to 49.00

San Francisco

No. 1 hvy. melting	$28.00
No. 2 hvy. melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	10.00
Cast iron borings	15.00
No. 1 RR. hvy. melting	28.00
No. 1 cupola cast.	$38.00 to 39.00

Los Angeles

No. 1 hvy. melting	$24.00
No. 2 hvy. melting	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
No. 3 bundles	16.00
Mach. shop turn.	8.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. fur. 1 ft and under	20.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	$36.00 to 38.00

Seattle

No. 1 hvy. melting	$31.00
No. 2 hvy. melting	27.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

Hamilton Ont.

No. 1 hvy. melting	$32.00
No. 1 bundles	32.50
No. 2 bundles	32.00
Mechanical bundles	30.50
Mixed steel scrap	28.50
Bushelings	27.50
Bush., new fact. prep'd.	30.50
Bush., new fact. unprep'd.	29.50
Short steel turnings	26.50
Mixed bor. and turn.	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Cast scrap	50.00

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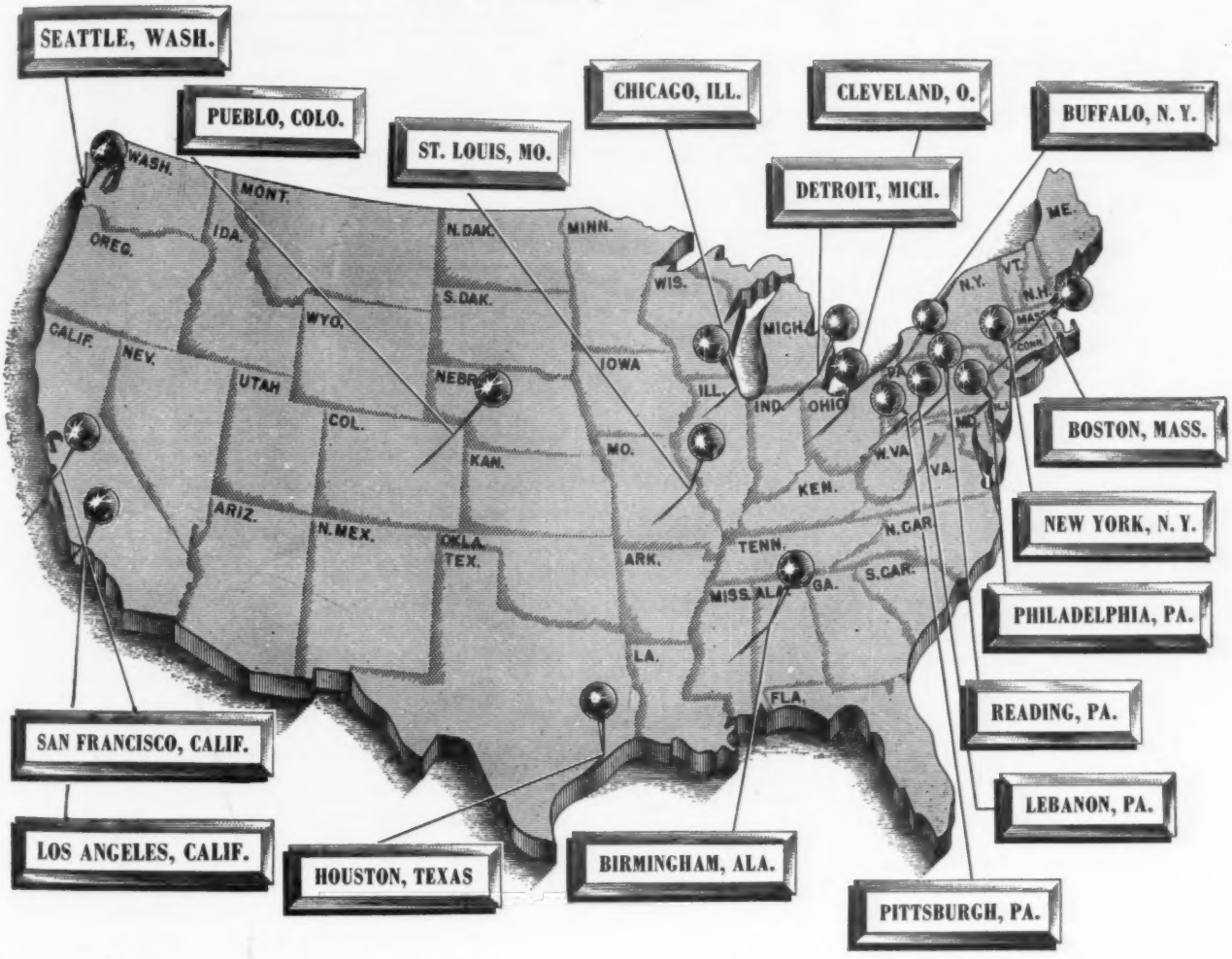

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

(Effective June 30, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 30 1953	June 23 1953	June 2 1953	July 1 1952
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.775¢	3.60¢
Cold-rolled sheets	4.775	4.775	4.575	4.35
Galvanized sheets (10 ga)	5.275	5.275	5.075	4.80
Hot-rolled strip	3.925	3.925	3.725	3.50
Cold-rolled strip	5.513	5.513	5.20	4.75
Plate	4.10	4.10	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Stainl's C-R strip (No. 302)	41.50	41.50	39.75	36.75
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	**$8.95**	**$8.95**	**$8.95**	**$8.70**
Tinplate, electro (0.50 lb.)	**7.65**	**7.65**	**7.65**	**7.40**
Special coated mfg. ternes	**7.75**	**7.75**	**7.75**	**7.50**
Bars and Shapes: (per pound)				
Merchant bars	4.15¢	4.15¢	3.95¢	3.70¢
Cold finished bars	5.20	5.20	4.925	4.55
Alloy bars	4.875	4.875	4.675	4.30
Structural shapes	4.10	4.10	3.85	3.65
Stainless bars (No. 302)	35.50	35.50	34.00	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.225¢	4.85¢
Rails. (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.075	$3.60
Light rails	5.20	5.20	5.00	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$59.00	$56.00
Slabs, rerolling	62.00	62.00	59.00	56.00
Forging billets	75.50	75.50	70.50	66.00
Alloy blooms, billets, slabs	82.00	82.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.325¢	4.10¢
Skelp	3.75	3.75	3.55	3.35
Composite: (per pound)				
Finished steel base price	4.632¢	4.632¢	4.417¢	4.131¢

	June 30 1953	June 23 1953	June 2 1953	July 1 1952
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$60.69	$60.69	$60.69	$58.19
Foundry, Valley	55.75	55.00	55.00	52.50
Foundry, Southern, Cin'ti	59.43	58.93	58.93	55.58
Foundry, Birmingham	51.88	51.38	51.38	48.88
Foundry, Chicago†	56.50	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.27
Basic, Valley furnace	55.25	54.50	54.50	52.00
Malleable, Chicago†	56.50	55.00	55.00	52.50
Malleable, Valley	55.75	55.00	55.00	52.50
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	9.85¢	8.04¢

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis.

Composite: (per gross ton)				
Pig iron	$56.01	$55.26	$55.26	$52.77
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$45.50	$43.50	$38.50	$38.50
No. 1 steel, Phila. area	43.50	42.50	40.50	40.50
No. 1 steel, Chicago	41.50	40.50	37.50	38.50
No. 1 bundles, Detroit	37.50	37.50	36.50	41.15*
Low phos., Youngstown	46.50	46.50	46.50	46.50*
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.00
No. 1 mach'y cast, Philadel'a.	45.50	45.50	47.50	52.00†
No. 1 mach'y cast, Chicago	44.50	43.50	42.50	42.50

* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

Composite: (per gross ton)				
No. 1 heavy melting scrap	$43.50	$42.17	$38.83	$39.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.875‡	29.875‡	29.875‡	24.50
Copper, Lake, Conn.	....	....	....	24.625
Tin, straits, New York	*90.50*†	93.875*	95.00	$1.21½
Zinc, East St. Louis	11.00	11.00	11.00	15.00
Lead, St. Louis	13.30	13.30	13.05	15.80
Aluminum, virgin ingot	20.50	20.50	20.50	19.80
Nickel, electrolytic	63.08	63.08	63.08	59.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. * Revised.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

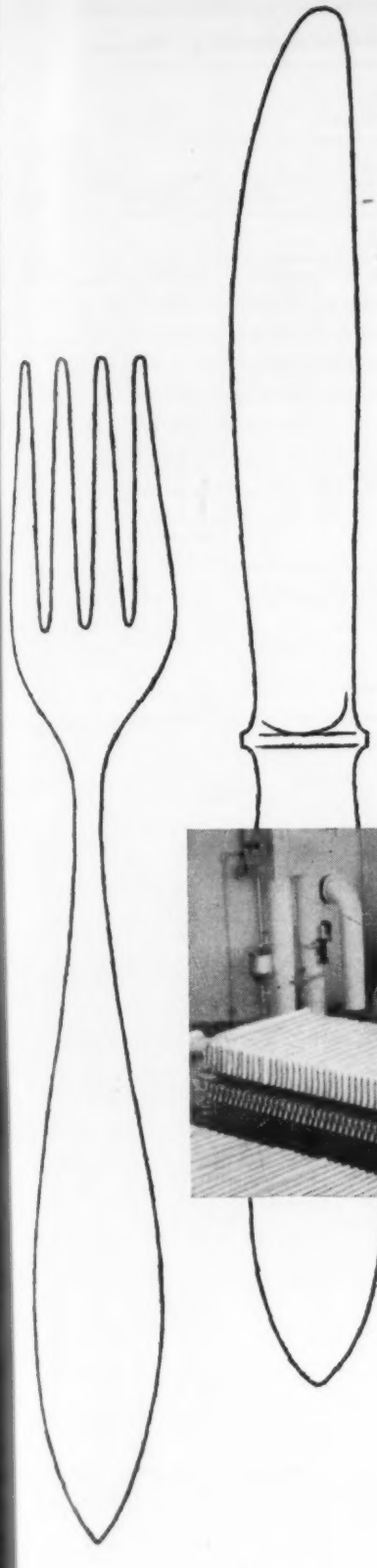
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb.

WAREHOUSES		Base price, f.o.b., dollars per 100 lb.											
		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars		
Cities	City Delivery Charge	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As Rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As Rolled	Cold-Drawn A 4140 Annealed
Baltimore	$.20	5.96–6.00	7.25–7.35	7.38	6.68	.....	6.55	6.59	6.56	7.64	.....	.....	.....	.....
Birmingham	.15	5.80	6.65	7.70[1]	5.80	.....	6.10	5.95	5.80	8.62	.....	.....	.....	.....
Boston	.20	6.66	7.54	8.39–8.93	6.81	9.08[2]	6.83–6.88	6.68	6.57	7.82	11.98	11.79–11.98	.....	14.23
Buffalo	.20	5.95	6.85	8.70–8.71	6.30–6.47	.....	6.35–6.38	6.15–6.20	5.95–6.05	7.15	.....	11.60–11.85	.....	13.90–14.15
Chicago	.20	5.95–5.96	6.82	7.75–7.90	6.10	.....	6.03–6.08	6.07	5.98	7.025	.....	11.45	.....	13.75
Cincinnati	.20	6.28	6.89	8.17	6.40	.....	6.55	6.54	6.28	7.38	.....	11.87	.....	14.17
Cleveland	.20	5.95–5.96	6.82–6.83	7.95–8.04	6.27	.....	6.25	6.40	6.04	7.10	.....	10.79–11.59	.....	12.79–13.80
Denver		7.70	8.55–9.15	9 79–10.25	7.60	.....	7.55	7.55	7.60	8.80	.....	.....	.....	15.25
Detroit	.20	6.15–6.22	7.00–7.02	8.04–8.59	6.39–6.50	7.05–7.67	6.55	6.54–6.57	6.26–6.27	7.32	11.97	11.57–11.82	14.02	12.82–14.12
Houston	.20	6.75–6.90	7.00–7.73	8.62–9.20	6.95–7.16	.....	6.75–6.86	6.80–6.95	6.95–7.13	9.55	13.15	12.65	14.65	14.40–14.90
Kansas City	.20	6 62	7 46–7 49	8 42	6.77	.....	6.75	6.74	6.65	7.80	.....	11.87	.....	.....
Los Angeles	.20	7.05	8.70	8.45–8.90	7.05–7.20	10.10–10.85	6.90	6.75–6.80	6.85–6.95	9.40–10.10	12.45–13.00	11.95–12.75	14.50–15.30	14.55–15.55
Memphis	.10	6.56	7.40–7.50	.....	6.60–6.98	.....	6.71	6.71–6.98	6.57–6.83	7.52–7.98	.....	.....	.....	.....
Milwaukee	.20	6.12–6.13	6.99	7.92–8.47	6.27–6.28	.....	6.20–6.25	6.24	6.15	7.295–7.30	.....	11.62	.....	13.92
New Orleans	.15	6.28	7.12	8.48	6.32	8.13	6.43	6.43	6.31	8.05	.....	.....	.....	.....
New York	.30	6.54–6.77	7.45–7.59	8.72	6.72–6.82	.....	6.67	6.50	6.75	7.90	12.00	11.84	14.03	14.14
Norfolk	.20	6.75	.....	.....	7.00	.....	6.95	6.95	7.00	8.50	.....	.....	.....	.....
Philadelphia	.25	6.30–	7.13–7.85	7.53–8.00	6.70	5.80	6.30	6.30	6.57–6.58	7.66	11.74	11.59	.....	13.89
Pittsburgh	.20	5.95–5.96	6.82	8.30	6.20–6.23	.....	6.03	6.07	5.98	7.12	.....	11.45	.....	13.75
Portland	.20	7.80–8.55	9.05–9.50	9.30	7.50–7.60	.....	7.05	7.25	7.25	9.40	.....	.....	.....	.....
Salt Lake City	.20	8.30–8.80		10.80[3]–11.30	8.45–8.55	.....	7.85	8.00	8.40	11.25	.....	.....	.....	.....
San Francisco	.15	7.15	8.40	9.25–9.70	7.05–7.25	10.00	6.90	6.50–6.75	6.85	9.40–9.50	13.00	12.50–12.75	15.05	15.30–15.55
Seattle	.20	8.15	8.70	10.10	8.02	.....	9.59	7.35	7.58	10.13	.....	13.20	.....	15.50
St. Louis	.20	6.25	7.12–7.67	8.05	6.40	8.07–8.19	6.43–6.48	6.47	6.28	7.43	11.90	11.75	.....	14.05
St. Paul	.15	6.47–6.62	7.48	8.41–8.56	6.77	.....	6.69	6.73	6.64	7.78	.....	11.86	.....	.....



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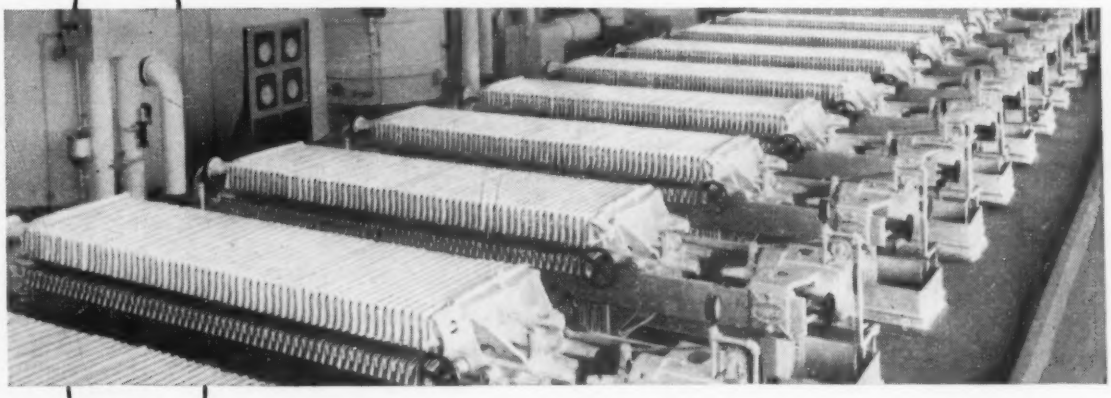

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STEEL PRICES

(Effective June 30, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Buffalo, N. Y.			$62.00 *B3*	$75.50 *B3, R3*	$82.00 *B3*		4.925 *B3*	4.15 *B3*	6.20 *B3*	3.925 *B3, R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.										4.325 *A2*		6.20 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$62.00 *B3*	$75.50 *B3*	$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Newark, N. J.													
	New Haven, Conn.											5.95 *A5* 6.20 *D1*		
	Phoenixville, Pa.													
	Putnam, Conn.													
	Sparrows Pt., Md.										3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Worcester, Mass.													
	Trenton, N. J.											6.45 *R4*		
MIDDLE WEST	Alton, Ill.													
	Ashland, Ky.										3.925 *A7*			
	Canton-Massillon, Ohio				$75.50 *R3*									
	Chicago, Ill.			$62.00 *U1*	$75.50 *R3, U1,W8*	$82.00 *U1, W8, R3*		4.925 *U1*	4.10 *U1, W8*	6.175 *U1*	3.925 *A1, W8*	5.95 *A1*	5.95 *R3*	
	Sterling, Ill.													
	Cleveland, Ohio				$75.50 *R3*							5.45 *A5, J3*		7.80 *J3*
	Detroit, Mich.		$63.00 *R5*		$78.50 *R5*	$85.00 *R5*					4.225 *G3*	5.65 *G3* 5.95 *D1* 6.05 *D2*	6.50 *G3*	7.90 *D2* 8.50 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*		4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*	3.925 *I3, U1, Y1*	5.70 *I3*	5.95 *U1, I3*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.45 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.80 *S1*	5.95 *S1*	7.65 *S1*
	Pittsburgh, Pa. Midland, Pa.	$59.00 *U1*	$62.00 *U1*	$62.00 *U1* $62.50 *J3*	$75.50 *J3, U1*	$82.00 *U1*	3.75 *U1* 3.85 *J3*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.425 *S7, S9*	5.45 *B4, J3* 6.15 *S7*		7.80 *J3*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.								4.35 *W3*		4.025 *W3*	5.45 *F3, W3*	6.30 *W3*	
	Youngstown, Ohio						3.75 *R3, U1*				3.925 *R3, U1*	5.45 *R3*	5.95 *U1*	
WEST	Fontana, Cal.	$86.00 *K1*	$88.00 *K1*	$81.00 *K1*	$94.50 *K1*	$101.00 *K1*			4.75 *K1*	6.825 *K1*	4.70 *K1*	7.35 *K1*	7.85 *K1*	
	Geneva, Utah				$75.50 *C7*				4.10 *C7*	6.175 *C7*				
	Kansas City, Mo.								4.80 *S2*		4.625 *S2*		7.10 *S2*	
	Los Angeles, Torrance, Cal.				$94.50 *B2*	$102.00 *B2*			4.80 *B2, C7*	6.85 *B2*	4.675 *B2, C7*			
	Minnequa, Colo.								4.30 *C6*		4.775 *C6*			
	San Francisco, Niles, Pittsburg, Cal.				$94.50 *B2*				4.75 *B2* 4.91 *P9*	6.80 *B2*	4.675 *B2, C7*			
	Seattle, Wash.				$94.50 *B2, S11*				4.85 *B2*	6.90 *B2*				
SOUTH	Atlanta, Ga.										4.475 *A8*			
	Fairfield, Ala. Alabama City, Ala.			$62.00 *T2*	$75.50 *T2*				4.10 *R3, T2*	6.175 *T2*	3.925 *R3, T2*		5.95 *T2*	
	Houston, Texas				$85.50 *S2*	$92.00 *S2*			4.60 *S2*		4.425 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

(Effective June 30, 1953)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25 -lb. base box	Hollowware Enameling 29 ga.	
													Bethlehem, Pa.
3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*							Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Claymont, Del.
													Coatesville, Pa.
4.325 *A2*					6.15 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.525 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
													Putnam, Conn.
3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.825 *A5*				Worcester, Mass.
									4.425 *R4*				Trenton, N. J.
													Alton, Ill.
3.925 *A7*		5.275 *A7*	5.175 *A7*										Ashland, Ky.
		5.275 *R3*											Canton-Massillon, Ohio
3.925 *A1, W8*					5.90 *U1*				4.525 *A5*				Chicago, Ill.
													Sterling, Ill.
3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3*	7.225 *J3*			4.525 *A5*				Cleveland, Ohio
4.125 *G3*	4.975 *G3*				6.375 *G3*	7.675 *G3*							Detroit, Mich.
													Duluth, Minn.
3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1* 5.325 *I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
		5.475 *G2*	5.875 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.375 *C9*											Kokomo, Ind.
	4.775 *A7*		5.175 *A7*	5.675 *A7*									Middletown, Ohio
4.225 *S1*				5.45 *S1*	5.90 *S1*						$7.40 *R3*		Niles, Ohio Sharon, Pa.
3.925 *J3, U1*	4.775 *J3, U1*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*	Pittsburgh, Pa. Midland, Pa.
	5.775 *D1*							4.725 *D1*					Portsmouth, Ohio
3.925 *W3, W5*	4.775 *W3, W5*	5.275 *W3, W5*		5.675 *W3, W5*		7.475 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.55 *W 5*	Weirton, Wheeling, Follansbee, W. Va.
3.925 *R3, U1*	4.775 *R3*				5.90 *U1, R3*	7.225 *R3*				$8.70 *R3*			Youngstown, Ohio
4.70 *K1*	5.875 *K1*				7.00 *K1*	8.275 *K1*			5.325 *K1*				Fontana, Cal.
4.025 *C7*													Geneva, Utah
													Kansas City, Mo.
4.625 *C7*		6.025 *C7*						5.325 *B2*					Los Angeles, Torrance, Cal.
									4.575 *C6*				Minnequa Colo.
4.625 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2*	4.525 *T2*	$8.80 *T2*	$7.50 *T2*		Fairfield, Ala. Alabama City, Ala.
													Houston, Texas

STEEL PRICES

(Effective June 30, 1953)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'rs. Bright
EAST	Bethlehem, Pa.				4.875 *B5*	6.275 *B5*	6.225 *B5*					
	Buffalo, N. Y.	4.15 *B5,R3*	4.15 *B5*		4.875 *B5, R5*	6.275 *B5*	6.225 *B5*	4.10 *B5*			6.25 *B5*	
	Claymont, Del.							4.35 *C4*		5.35 *C4*		
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken, Pa.							4.55 *A2*	5.15 *A2*		6.50 *A2*	
	Harrisburg, Pa.											
	Hartford, Conn.			5.85 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Newark, N. J.			5.70 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.											
	Putnam, Conn.			5.85 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Worcester, Mass.											5.825 *A5*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio	4.15 *R3*		5.20 *R2, R3*	4.875 *R3*	6.325 *R2, R3*						
	Chicago, Ill.	4.15 *R3, U1, W8*	4.15 *R3* 4.90 *N4*	5.20 *A5,W10, W8, L2, B5*	4.875 *U1, W8, R3*	6.325 *A5,W8, W10, L2, R3, B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A5, R3,* 5.625 *W7*
	Cleveland, Ohio	4.15 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5,C13*		4.10 *J3,R3*			6.25 *J3*	5.525 *A5, R3, C13*
	Detroit, Mich.	4.30 *R5* 4.50 *G5*		5.35 *R5, P8*	5.025 *R5* 5.225 *G3*	6.475 *R5, P8*	6.875 *G3*	4.65 *G3*			7.10 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary Ind. Harbor, Crawfordsville, Indiana	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1 Y1*	6.325 *R3, M5*	6.225 *U1, I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1, I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.											
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.75 *N4*	5.00 *N4*									5.825 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.70 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5, J3, W10, R3*	4.875 *U1*	6.325 *A5, W10*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5,J3*
	Portsmouth, Ohio											5.725 *D1*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.40 *W3*				
	Youngstown, Ohio	4.15 *R3, U1*	4.15 *R3, U1*		4.875 *U1*		6.225 *U1*	4.10 *R3, U1*				
WEST	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.85 *S2*	4.85 *S2*		5.755 *S2*						5825 *S2*	
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					
	Minnequa, Colo.	4.40 *C6*	4.75 *C6*					4.70 *C6*				5.475 *C6*
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2*	4.90 *B2,S11*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.45 *A8*	4.45 *A8*									5.775 *A8*
	Fairfield, Ala. Alabama City, Ala.	4.15 *R3,T2*	4.15 *R3,T2*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Texas Ft. Worth, Texas	4.65 *S2*	4.65 *S2*		5.375 *S2*			4.60 *S2*				

Steel Prices

(Effective June 30, 1953)

Key to Steel Producers

With Principal Offices

Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N. J
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
	Col	Col	Col	Col	Col	Col		
Alabama City *R3*	131	140	...	149	...	153	6.675	7.07
Aliquippa, Pa. *J3*	...	...	...	...	...	...	...	...
Atlanta *A8*	...	...	...	...	...	...	...	...
Bartonville *K2*	...	...	...	...	...	...	...	...
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago, Ill. *N4*	131	143	...	149	...	156	6.675	7.225
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.675	...
Crawfordsvl. *M4*	...	...	...	...	...	...	...	...
Donora, Pa. *A5*	131	140	...	149	...	153	6.675	7.075
Duluth *A5*	131	140	145	149	...	153	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	...	153	6.675	7.075
Houston *S2*	...	...	...	...	...	...	...	...
Johnstn., Pa. *B3*	131	143	...	...	156	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	...	153	6.675	7.075
Kokomo, Ind. *C9*	...	...	...	...	...	...	...	...
Los Angeles *B2*	...	...	...	...	...	...	...	...
Kansas City *S2*	...	...	...	...	...	...	...	...
Minnequa *C6*	132	146	138	137	...	153	6.325	6.70
Monessen *P6*	...	...	...	...	...	...	...	...
Moline, Ill. *R3*	...	...	140	...	...	...	...	...
Pittsburg, Cal. *C7*	150	163	...	173	173	173	7.625	8.025
Portsmouth *P7*	...	...	...	...	...	...	...	...
Rankin, Pa. *A5*	131	140	...	...	...	153	6.675	7.075
So. Chicago *R3*	131	140	140	149	...	153	6.675	7.075
S. San Fran. *C6*	...	...	...	...	...	...	...	...
Sparrows Pt. *B3*	133	...	...	151	158	158	6.775	7.325
Struthers, O. *Y1*	...	...	...	...	...	...	...	...
Worcester *A5*	137	...	...	...	...	...	6.975	...
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*).

*** Alabama City and So. Chicago don't include zinc extra Galvanized products based on zinc at 11.0¢ per lb.**

STAINLESS STEELS

Base price cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50-46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25-37.50	37.50	39.75	39.75	59.00	45.75-46.00	51.25	30.00	30.50-31.00	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25-38.50	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7* McKeesport, Pa., *U1;* Washington, Pa., *W2;* (type 316 add 4.5¢) *J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Ft. Wayne, *J4;* Lockport, N. Y., *R4.*

Strip: Midland, Pa., *C11;* Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa. *W2;* (type 316 add 4.5¢); W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Middletown, O., *A7;* Harrison, N. J., *D3;* Youngstown, *C5;* Lockport, N. Y., *S4;* Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7;* Wallingford, Conn., *W1.*

Bars: Baltimore, *A7;* Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Lockport, N. Y., *S4;* Canton, O., *T5;* Ft Wayne, *J4.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11.*

Plates: Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind.; *I2;* Lockport, N. Y., *S4;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3.*

Forged discs, die blocks, rings: Pittsburgh, *C11;* Syracuse, *C11;* Ferndale, Mich., *A3;* Washington, Pa., *J2.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11.*

Miscellaneous Prices

(Effective June 30, 1953)

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	23.75	8.0	26.75	12.0	29.75	15.5	31.75	16.0	32.75	17.0	33.25	17.5	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*																						
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*																						
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 11.0¢.

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.00
Foundry beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	28.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	8.35	9.60	10.40	10.95	11.50	12.20	
Brackenridge *A3*	8.35	9.60	10.40	10.95		12.20	
Granite City *G2*							
Ind. Harbor *I3*	7.85	8.35	9.60				
Mansfield *E2*							
Newport, Ky. *N5*	7.85	8.35	9.60	10.40	10.95		
Niles, O. *N3*	7.85	8.35					
Vandergrift *U1*	7.85	8.35	9.60	10.40	10.95	11.50	12.20
Warren, O. *R3*	7.85	8.35	9.60				
Zanesville *A7*	7.85	8.35	9.60	10.40	10.95	11.50	12.20

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$110.30 to $113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in. Birmington	96.50 to 101.00
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$128.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D
Babcock & Wilcox	2	13				
	2½	12				
	2	12				
	3½	11				
	4	10				
National Tube	2	13		32.98	24.88	
	2½	12	36.82	44.41	33.50	
	3	12	42.52	51.28	38.69	
	3½	11	49.63	59.87	45.16	
	4	10	65.91	79.50	59.97	
Pittsburgh Steel	2	13				
	2½	12				
	3	12				
	3½	11				
	4	.0				

PIG IRON

(*For latest pig iron price increases see p. 165*)

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem *B3*	56.50	57.00	57.50	58.00	.....	.....
Birmingham *R3*	50.88	51.38	.....	.....	.....	.....
Birmingham *W9*	50.88	51.38	.....	.....	.....	.....
Birmingham *S5*	50.88	51.38	.....	.....	.....	.....
Buffalo *R3*	54.50	55.00	55.50	.....	.....	.....
Buffalo *H1*	54.50	55.00	55.50	.....	.....	66.75
Buffalo *W6*	54.50	55.00	55.50	.....	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....	.....
Cleveland *A5*	54.50	55.00	55.00	55.50	59.50	.....
Cleveland *R3*	54.50	55.00	55.00	.....	.....	.....
Daingerfield, Tex. *L3*	50.50	51.00	51.00	.....	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....	.....
Everett, Mass. *M6*	.....	59.50	60.00	.....	.....	.....
Fontana *K1*	60.50	61.00	.....	.....	.....	.....
Geneva, Utah *C7*	54.50	55.00	.....	.....	.....	.....
Granite City, Ill. *K3*	56.40	56.90	57.40	.....	.....	.....
Hubbard, Ohio *Y1*	54.50	55.00	55.00	.....	.....	.....
Jackson, Ohio *J1,G1*	.....	.....	.....	.....	.....	65.50
Minnequa *C6*	56.50	57.50	57.50	.....	.....	.....
Monessen *P6*	56.50	.....	.....	.....	.....	.....
Neville Island *P4*	54.50	55.00	55.00	55.50	.....	.....
Pittsburgh *U1*	54.50	.....	.....	55.50	.....	.....
Sharpsville *S3*	54.50	55.00	55.00	55.50	.....	.....
Steelton *B3*	56.50	57.00	57.50	58.00	62.50	.....
Swedeland *A2*	58.50	59.00	59.50	60.00	.....	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....	.....
Troy, N. Y. *R3*	56.50	57.00	57.50	58.00	62.50	.....
Youngstown *Y1*	54.50	55.00	55.00	55.50	.....	.....
N. Tonawanda, N. Y. *T1*	.....	55.00	55.50	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over. Silvery Iron: Add $1.50 per ton net for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

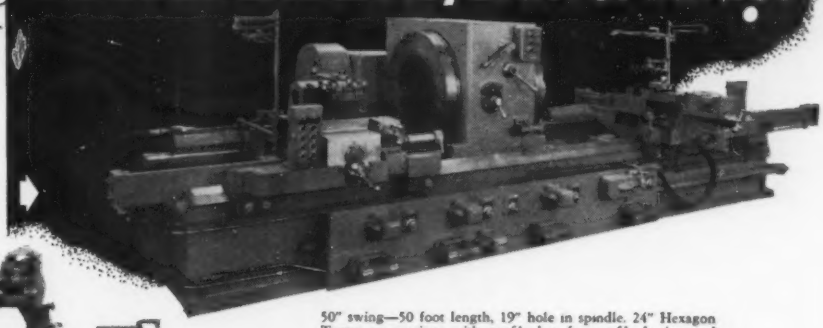
C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7**	6.15	8.00	8.60	10.55	12.85
Carnegie, Pa. *S9*	.....	8.00	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D2*	6.05	8.25	8.85	.....	.....
New Castle, Pa. *B4*	5.80	8.00	8.60	.....	.....
New Haven, Conn. *D1*	.....	.....	.....	.....	.....
Sharon, Pa. *S1*	5.80	8.00	8.60	10.55	12.85
Trenton *R4*	.....	7.95	8.55	10.50	12.80
Weirton, W. Va. *W3*	5.80	8.00	8.60	10.55	12.85
Worcester, Mass. *A5*	5.75	7.95	8.90	10.85	13.15
Youngstown *C5*	.....	.....	.....	.....	.....

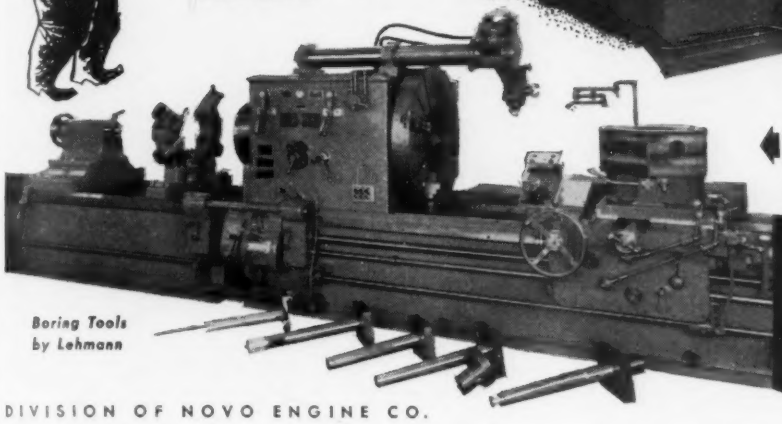
* Sold on Pittsburgh base.

But Boss and workers agree that you get amazing new efficiency with these

LEHMANN Large Hole DOUBLE-ENDER Hydratrol Lathes



42" swing, 16 foot bed, 18" hole in spindle —Special headstock for short work piece. Semi-automatic multiple, longitudinal and cross feeds hydraulically operated on both ends of headstock.



50" swing—50 foot length, 19" hole in spindle. 24" Hexagon Turret on carriage with profile bar for profile boring and grinding. Retractable diamond profile wheel dresser. Weight 72,000 lbs.

Double End Hydratrol Lathes are built in sizes from 18" with holes up to 7½" to larger sizes with holes to suit the job. Double End operations avoid necessity for resetting the work, and insure relative concentricity of boring and turning operations and squareness of faces at both ends.

Boring Tools by Lehmann

LEHMANN MACHINE COMPANY
GRAND at CHOUTEAU • ST. LOUIS 3, MO.

DIVISION OF NOVO ENGINE CO.

IN TROUBLE?

We can be your mill source for

LARGE ROUNDS

GREEN RIVER STEEL CORPORATION

OWENSBORO, KENTUCKY

Miscellaneous Prices

(Effective June 30, 1953)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.325	5.20	5.275				
Chicago *R3*				7.05			
Cleveland *R3*							
Ensley *T2*	4.325	5.20					
Fairfield *T2*		5.20				5.125	
Gary *U1*	4.325	5.20				5.125	
Ind. Harbor *I3*	4.325		5.275	7.05		5.125	
Johnstown *B3*		5.20					
Joliet *U1*		5.20	5.275				
Kansas City *S2*							
Lackawanna *B3*	4.325	5.20	5.275			5.125	
Lebanon *B3*							
Minnequa *C6*	4.075	5.05	5.075	6.80		4.925	10 00
Pittsburgh *R3*							
Pittsburgh *O1*							
Pittsburgh *P5*							
Pittsburgh *J3*							
Pitt'g, Cal. *C7*						5.275	
Seattle *B2*						5.275	
Steelton *B3*	4.325		5.275			5.125	
Struthers *Y1*							
Torrance *C7*						5.275	
Youngstown *R3*							

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese ..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*29.5	
Washington, Pa. *J2*	*29.5	
Claymont, Del. *C4*	*29.50	
New Castle, Ind. *I2*	*29.77	*26.24
Nickel-carbon		
10 pct. Coatesville, Pa. *L4*	32.5	
Inconel-carbon		
10 pct. Coatesville, Pa. *L4*	40.5	
Monel-carbon		
10 pct. Coatesville, Pa. *L4*	33.5	
No. 302 Stainless copper stainless, Carnegie, Pa. *A4*		77.00
Aluminized steel sheets, hot dip, Butler, Pa., *A7*		7.75

* Includes annealing and pickling, sandblasting.

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in In.	Length in In.	Cents Per lb.
	GRAPHITE	
24	84	20.50
18, 20	72	20.00
12, 14	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.50
2½	30	28.00
2	24	43.50
	CARBON	
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

72½% $44.00
70% or more 42.50
60% or less 38.00

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

Pct Off List

	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	10	24	10	24
9/16 in. & ⅝ in.	8	21	1	16
¾ in. to 1½ in. inclusive	4	18	+4	12
1⅝ in. & larger	2	17	+4	12

Nuts, Hot Pressed—Hexagon

½ in. & smaller	22	33	18	30
9/16 in. & ⅝ in.	12	25	1	16
¾ in. to 1½ in. inclusive	8	21	+3	13
1⅝ in. & larger	4	18	+3	13

Nuts, Cold Punched—Hexagon

½ in. & smaller	22	33	18	30
9/16 in. & ⅝ in.	19	31	13	26
¾ in. to 1½ in. inclusive	15	27	8	21
1⅝ in. & larger	2	17	+4	12

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller	33	43	26	37
9/16 in. & ⅝ in.	27	38	19	31
¾ in. to 1½ in. inclusive	21	33	11	25
1⅝ in. & larger	5	19	net	15
	Light			
7/16 in. & smaller	33	43		
½ in. thru ⅝ in.	26	37		
¾ in. to 1½ in. inclusive	18	30		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $8.50

Pct Off List

7/16 in. and smaller 30

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
¾ in. thru 1 in. up to & including 6 in. 26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
¾ in. thru 1 in. up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes ... 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	11	25
9/16 in. & ⅝ in. x 6 in. & shorter	15	27
¾ in. & larger x 6 in. & shorter	14	26
All diam. longer than 6 in...	8	22
Lag, all diam. x 6 in. & shorter	19	31
Lag, all diam. longer than 6 in.	16	28
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25) .. $99.10
No. 1 Ohio 92.40
Sec. quality, Pa., Md., Ky., Mo., Ill. .. 92.40
No. 2 Ohio 83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60) 14.40

Silica Brick

Mt. Union, Pa., Ensley, Ala. $99.30
Childs, Pa. 103.95
Hays, Pa. 105.10
Chicago District 123.40
Western Utah 116.55
California 122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago 126.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 17.30
Silica cement, net ton, bulk, Hays, Pa. 19.80
Silica cement, net ton, bulk, Emsley, Ala. 18.45
Silica, cement, net ton, bulk, Chicago District 18.45
Silica cement, net ton, bulk, Utah and Calif. 25.95

Chrome Brick *Per net ton*

Standard chemically bonded Balt., Chester $86.00
Burned, Balt., Chester 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite *St. ⅝-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., in bulk 38.00
in sacks 43.70

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.75

LAKE SUPERIOR ORES

51.50% *Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953 to end of season.*

Gross Ton

Openhearth lump $11.15
Old range, bessemer 10.30
Old range, nonbessemer 10.15
Mesabi, bessemer 10.05
Mesabi, nonbessemer 9.90
High phosphorus .....

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.l.f. New York, ocean bags .... 10.9¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carloads lots ..... 15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 mieron, 98%, 99.8+% Fe. 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots ..... 30.00¢ to 33.25¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb .. 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd .. $3.50
Lead ..... 21.75¢
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 88.0¢
Nickel, annealed ..... 95.0¢
Nickel, spherical, unannealed 92.0¢
Silicon ..... 38.5¢
Solder powder .. 7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 83.9¢
Stainless steel, 316 ..... $1.10
Tin ..... 14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $8.50
Zinc, 10 ton lots ..... 23.0¢ to 30.5¢

Ingersoll specializes in . . .

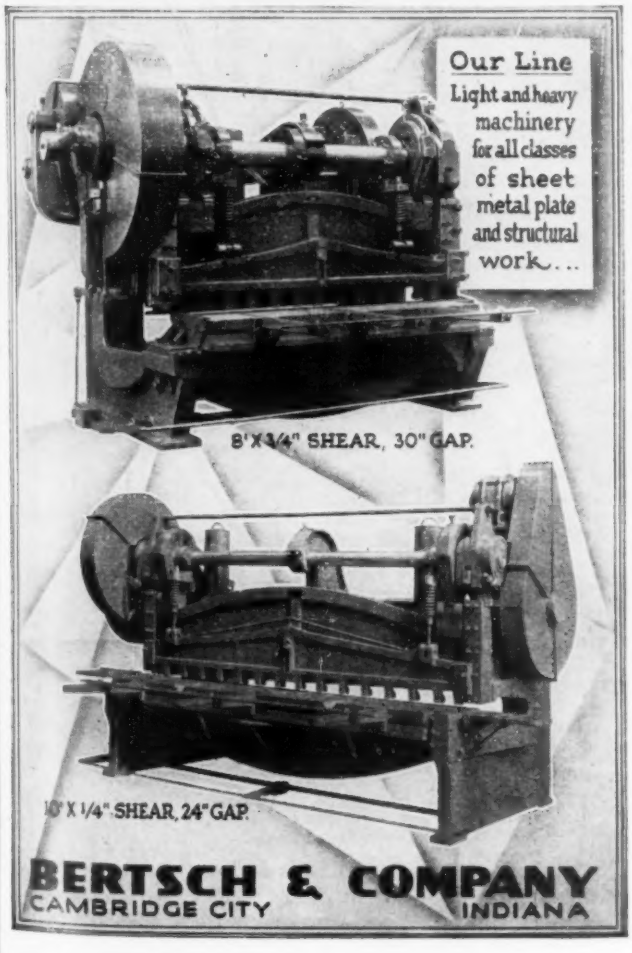
STAINLESS STEEL *Sheets and plates*
STAINLESS-CLAD STEELS

ENGINEERING B-W PRODUCTION

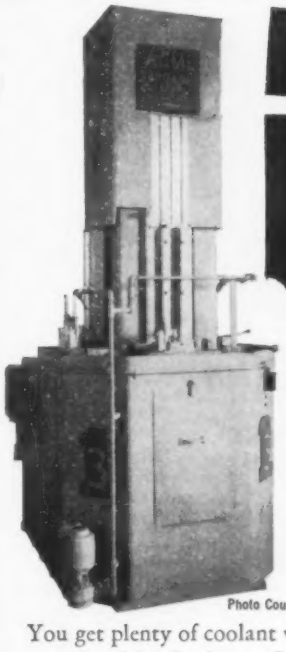
STEEL DIVISION

BORG-WARNER CORPORATION

310 South Michigan Avenue, Chicago 4, Illinois
Plant: New Castle, Indiana


Our Line
Light and heavy machinery for all classes of sheet metal plate and structural work...
8' X 1/4" SHEAR, 30" GAP.
10' X 1/4" SHEAR, 24" GAP.

BERTSCH & COMPANY
CAMBRIDGE CITY INDIANA



SPLIT SECOND COOLANT FLOW

with a

RUTHMAN GUSHER COOLANT PUMP

This Acme Model U-31 Broaching Machine is equipped with a Ruthman Pump.

Photo Courtesy Acme Broach Corp.

You get plenty of coolant where and when you want it with a Ruthman Gusher Coolant Pump from the moment the machine is turned on. There is no packing or priming necessary and Gusher Pumps are designed for a long trouble-free life. Write us today, we'll be glad to advise you on your coolant problems.

THE RUTHMAN MACHINERY CO.

1809 READING ROAD, CINCINNATI 2, OHIO

Ferroalloy Prices

(Effective June 30, 1953)

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	34.50	0.20% C	33.50
0.10% C	34.00	0.50% C	33.25
0.15% C	33.75	1.00% C	33.00
2.00% C			32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Cr, 60-65% Si, 3.00% max. Fe

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

CMSZ

Contract price, cents per lb of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	20.75
Less ton lots	22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size:

Producing Point	Base Mn Content	Cents per lb (Contained Mn)
Niagara Falls, Alloy, Ashtabula	76-80%	13.15
		(Per lb of alloy)
Etna, Clairton, Pa.	74-76%	10.00
Johnstown, Pa.	74-76%	10.00
Sheridan, Pa.	74-76%	10.00

Add or substract 0.1¢ for each 1% Mn above or below base content.

Briquets—delivered, 66 pct. Mn.

Carload, bulk	12.50
Ton lots, packed	14.05

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	30.00
Ton lots	32.00
Less ton lots	34.00 to 37.00
Premium for hydrogen-removed metal	1.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30	31.50
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.055 per ton for each additional 0.50% Si up to and including 17%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	18.00
97% Si, 1% Fe	18.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90.95% Si			17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carloads	9.90
Ton lots	11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $4.45

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.31

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... $1.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B ... $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound .... 50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.30
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 10% B	1.30
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.

No. 1	$1.00
No. 6	65¢
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18%, B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
Less ton lots $1.30

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

FLEXAUST* HOSE
WIDENS DESIGN LATITUDE
Eliminates Critical Alignment

Highly Flexible Airtight Ducting
... For Moving Air, Gases, Materials
Via Pressure, Suction, Gravity

NEW CATALOG No. 35 SHOWS HOW FLEXAUST HOSE:

- **Saves labor** because Flexaust hose bends sharply without kinking or flattening, is easy to install.
- **Assures long life** with its excellent resistance to moisture, acids, abrasion.
- **Gives trouble-free service** because of its spiral-wire reinforced, double-ply construction and Neoprene coating.
- **Has many applications** in virtually every industry.
- **Custom-made accessories** are produced for unusual or special applications.

*Trade-mark

Sizes: 1¼" ID to 28" ID
Varied types, coatings and fittings

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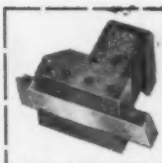
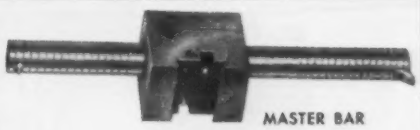

EXTENSION TURNING BAR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KDK
VERSATILE TOOL HOLDER
Proved to be far advanced over other type holders.

THREADING AND FACING BAR

TURNING & FACING BAR

The KDK versatile tool holder is a time saver on NON-PRODUCTION and PRODUCTION jobs. Five bars hold nine tools making up twenty-four (24) combinations; gives unlimited operations on set up and enables operator to do most any job. Thousands of sets in use.

Airesearch Mfg. Co., Lockheed, Convair, Hughes Aircraft, and many other leading companies use the KDK Versatile Tool Holder.

ORDER NOW FROM . . .

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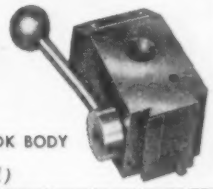
303 Maple Blvd., Monroe, Michigan
(Distributors and jobbers wanted)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COWLES
GANG SLITTING KNIVES
OVER 30 YEARS EXPERIENCE

Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by Toolmakers.

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PERFORATED METALS
FOR
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PERFORATIONS IN
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ARCHITECTURAL GRILLES

DIAMOND MFG. CO.
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WRITE FOR CATALOG 35

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT

D. C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	2000	Whse.	Mill	600	230/460
1	940	Whse.	QM	250	140/170
1	900	Whse.		250	450/550
1	680	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	300/900
2	450	Whse.		550	415
1	400	G.E.	MCF	550	300/1050
2	380	Whse.	CB-5094	230	575/1150
1	300/360	G.E.	MPC	230	360/920
1	300	Rel.	1970T	230	720
1	300	Whse.	CB-5113	230	400/800
1	150	Whse.	CB-2073	230	575/1150
1	150	G.E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
8	150	Cr. Wh.	83H-TEFC	230	960
1	150	Whse.	SK-151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

MILL & CRANE

1	50	G.E.	CO-1810	230	725
1	30	Whse.	K-5	230	975
4	15	Whse.	K-5	230	630
8	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
3	6.25	Whse.	K-3	230	680
4	5	C.W.	SCM-FF	230	1750
2	3	Whse.	HK-2	230	835

A.C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1800	G.E.	MT-498	2300	360
1	1540	ABB		2300	720
1	1200	G.E.	MF-26	2300	275
2	1000	A.C.	Mill	2300	240
1	800	Whse.	CW	550	350
1	800	G.E.	IM	440	900
1	500	G.E.	M-574-Y	6600	900
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1218	2200	435
1	350	G.E.	MT-442Y	2200/4000	253
2	300	G.E.	MT-565Y	2300	900
1	300	A.C.	3-Brg	440	505
1	250	G.E.	MT-424-Y	4000	257
1	250	G.E.	MT-559S	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	413	505
1	200	G.E.	IM-17	440	600
1	200	G.E.	IM	440	435
1	200	G.E.	MTP	440	1170
1	150 (unused)	Whse.	CW	2300	435
1	150	G.E.	IM-16	440	600
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2200	435
1	100	G.E.	IM	440	609
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2200	435
1	100	Whse.	CW-868A	440	700

SQUIRREL CAGE

2	850	G.E.	FT-559BY	440	3570
2	450	Whse.	CS-1420	2300/4150	354
1	200	G.E.	IK-17	440	580
1	200	G.E.	IK	440	865
8	200	G.E.	KT-557	440	1800
1	150	Whse.	CS-856S	440	880
1	150	Whse.	CS	440	580
1	150/75	G.E.	IK	440	900/450
2	125	Al. Ch.	ARW	2200	1750
1	125	G.E.	KF-6328-Z	440/2200	3585
1	125	Whse.	MS	440	485

SYNCHRONOUS

2	3500	G.E.	TS	2300	257
2	3100	G.E.	ATI	2300	360
2	1750	G.E.	ATI	2300	3600
2	2000	Whse.		2300	120
2	735	G.E.	ATI	2300/12000	600
1	450	Whse.		2200	450
2	850	G.E.	TS	2200	156

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
1	2000	G.E.	500	660	11000
1	2000	G.E.	514	600	6600/13200
8	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	360	275	4400
1	1500	G.E.	600	600	4160
1	1500	C.W.	514	115	4000/13000
2	1000	Whse.	900	600	4160
1	1000	G.E.	900	260	6600
1	1000 (SU)	G.E.	900	250	2200
1	750	Whse.	900	275	4160
1	750	C.W.	514	115	2300
1	600	G.E.	720	250	440/2300
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	900	250	6600/13200
1	500	Whse.	1200	125/250	2300
1	400	Whse.	1200	250	2300
1	400 (SU)	Cr. Wh.	1200	125/250	2300
1	150	Whse.	1200	275	2300
1	140 (SU)	Cr. Wh.	690	125/250	440/2300
1	100	Delco	1200	125/250	2300
1	100	G.E.	1170	125	220/440

FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltages
1	3000	G.E.	25/60	2300/2300/4000
2	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2560	11000/2300

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Promise Fast Delivery . . . Two Detroit manufacturers recently placed almost identical orders for thread grinders with two different machine tool builders. Both manufacturers were promised quick delivery.

In what has been the normal market since Korea, a substantial part of both these orders would have been placed with used machinery dealers because of the long wait required for most types of new machine tools. Now, however, builders are able to fill many orders without delay.

Can't Sell Time . . . One Detroit dealer, reiterating a statement by Frank Laurens, Laurens Bros., Inc., Cincinnati, at the recent Machinery Dealers National Assn. convention, said: "We have been selling delivery. Now we have to go back to selling used machinery."

The Detroit market is in a state of transition. Emphasis is on price. Many dealers admit that they believe prices are too high, even on equipment in strong demand. All agree that a downward trend is in progress.

Will Drop More . . . Prices of late model equipment for which there is good demand now average 70 to 80 pct of new prices. This represents a drop and many used tool men believe an additional downward revision will be necessary to bring purchasers into the market.

Detroit dealers report business is not bad by pre-Korea standards but that it has fallen off considerably from the boom level.

Inquiries are plentiful. Many types of machine tools are still in good demand and the supply of some equipment is critical. But price is still the major consideration. Purchasers are sure the market is softening and believe that even critical tools will soon be available with a minimum of delay.

Buyers Are Sellers . . . It is reported that more tools are coming into the market. Many sources, such as auto plants, that were once good customers are now selling their used tools as delivery of new models catches up with demand.

Auctions are becoming more frequent, and in June two sizable plants in Michigan sold out. Prices were generally close to former ceiling levels. Increase in the number of auctions is believed to be the result of manufacturers' desire to sell their used equipment while they can still get the top dollar.

Fear Sharp Drop . . . Some dealers, however, fearing a sharp drop in the market, are reluctant to do much buying. One used machinery firm bought three lathes 2 months ago and still has them. There is less competition from users at auctions, although certain types of equipment still brings them out.

Tight items in the Detroit area are radial drills, universal milling machines, large surface grinders and some small surface grinders.

Sales Are Better . . . Recent report from the Cleveland market indicates used machinery has been selling better during the second quarter. Fatter order books are by no means the rule, but many dealers say they are moving out of the first quarter doldrums.

Premium price tags on late model tools are disappearing because of increased availability and stiffening buyer resistance. Dealers who have found business improving say demand for smaller all-purpose machines is on the upgrade. They believe this trend is the result of subcontractors' trying to realign tooling requirements as defense orders run out.

National Industrial Service Assn., with one convention just behind it, is already making plans for its 1954 Detroit meeting. Members are being surveyed on what topics they want covered, preference for large forums or small groups dealing with special subjects, and the kind of entertainment they want.